1859 PUBLISHED WEEKLY 1918

AMERICAN GAS ENGINEERING JOURNAL

FORMERLY

AMERICAN GAS LIGHT JOURNAL

VOL. CIX., No. 14
WHOLE No. 3161

NEW YORK, SATURDAY, OCTOBER 5, 1918

Subscription $3 per year
$4 Canada $5 Foreign

When You Fight---Fight

FIGHT as these American soldiers fought in the streets of Fismes. "They covered themselves with glory," the papers say. Of course they did—they are Americans.

They met the finest of the enemy's troops in a terrific hand to hand struggle. They used their guns—their bayonets—their bare fists. Every American soldier went after his man desperately, fearlessly, persistently, with one great driving purpose—to whip that Prussian Guard, to silence its machine guns—to win!

It's a pretty good way to fight—this American way. It wins battles over there, it will win a splendid victory over here—if we *fight* when we fight—if we buy Liberty Bonds to our utmost.

When you fight—*fight!* **When you buy—*buy!***

Lend the way they fight—Buy Bonds to your utmost

This Space Contributed to Winning the War by

A FRIEND OF THE BOYS "OVER THERE"

INDEX TO CONTENTS, PAGE 324 ADVERTISERS' INDEX, PAGE 20

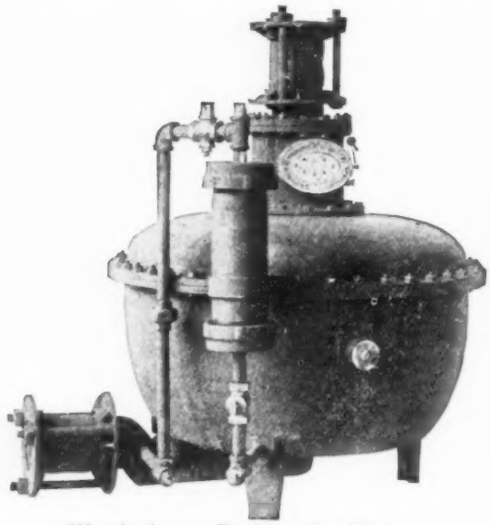
Two Leaders

IRONCLAD

THE 100% METER

The only Cast-Iron Dry Gas Meter with slide valves, in place of the old-style flat rotary valve and flag on inside of diaphragms.

Seats for both valves are cast in one piece and attached to the main case, assuring absolute and continued alignment of the valve mechanism, and its positive and accurate operation.



Westinghouse Positive Gas Meter

Westinghouse

Improved

Positive Gas Meter

indicates accurately small volumes of gas, either artificial or natural, that other meters will not pick up and, being constructed entirely of metal, no parts are injured by action of either gas or condensate.

Pittsburgh Meter Company

General Office and Works: EAST PITTSBURGH, PA.

New York, 149 Broadway
Chicago, 5 South Wabash Ave.
Kansas City, 6 West 10th St.
Seattle, 802 Madison St.
Columbia, S. C., 1433 Main St.
Los Angeles, 931-2 Union Oil Bldg.

Also manufacturers of Meter Provers, and Keystone, Arctic, Eureka, Keystone-Compound and Utility Water Meters

Entered as second-class matter January 9, 1917, at the post-office at New York, N. Y., under the Act of March 3, 1879.

AMERICAN
GAS ENGINEERING JOURNAL
FORMERLY THE AMERICAN GAS LIGHT JOURNAL
Vol. CIX, No. 14 NEW YORK, OCTOBER 5, 1918 Whole No. 3161

Use of Gas In the Manufacture of Soaps and Similar Compounds

Though Not As Yet Extensively Worked by Industrial Fuel Gas Man, This Important Field of Industry Offers Excellent Prospects

By GILBERT C. SHADWELL

While the subject of soap making on a large scale seldom involves a very extensive use of gas, there are quite a number of special soap compounds in the manufacture of which gas plays a most important part.

Certain toilet soaps are made in small quantities and are conveniently boiled and mixed in a jacketed cauldron furnace, the most convenient fuel for which is gas. In addition many of the polishes for silverware, etc., have as their basis the substances from which soap is made, and these polishes are very conveniently boiled in a gas-heated kettle, which is often jacketed to be used with or take the place of steam.

The processes of soap manufacture may be classified as follows: (1) Cold process, and (2) boiling processes, which is, roughly, (a) in accordance with the temperature employed, or (b) according to the "starting material" employed, *i.e.*, acid or oil and fat, and the relative amount of alkali.

Processes of Manufacture

While the boiling process concerns us chiefly in the gas business, it may be of interest to skim over the general nature of soap manufacture so that the whole matter may be more completely understood, because there is little doubt that after-war conditions will bring about more and more the wider use of gaseous fuels, and what is now being accomplished almost exclusively with coal will tend to be carried out with gas later, if the signs of the times are not mistaken. Hence the more we as gas men know of the important industries the better for us.

Generally speaking, soap is a chemical compound or mixture of chemical compounds resulting from the interaction of fatty oils and fats with alkalis. Soap, both as a medicinal as well as a cleansing agent, was known to the Romans, who in turn learned of it from the Egyptians, who apparently made it from the tallow of various animals combined with the ashes of plants. All plants contain alkali to some greater or less extent, so that the resultant combination must have been very good, so far as its cleansing properties were concerned, and it is more than likely that its action was far less harsh than some of the soaps we meet with to-day.

In the making of soap to-day the cold process mentioned above consists in the use of readily saponifiable oils such as coco oil. These are stirred in a cauldron or kettle, such as that shown in Fig. 1, where

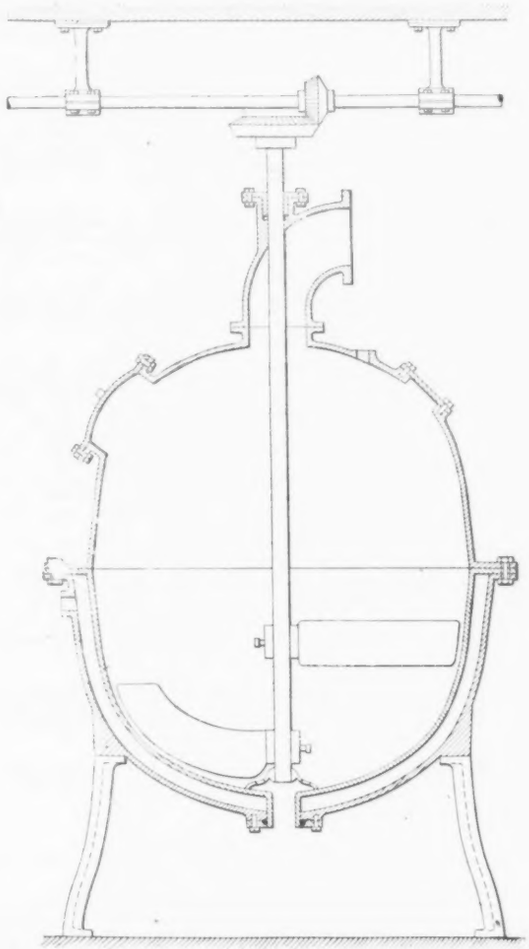


FIG. 1—SOAP MIXING KETTLE

FIG. 2—JACKETED STILL FOR SOAP MAKING

the paddles revolve for the purpose of effecting saponification. The temperature needed is low, but it should be uniform at about 100 deg. Fahr., or somewhat lower. Hence, although this work is sometimes carried out at atmospheric temperature, a water-jacketed cauldron furnace is a valuable adjunct to ensure proper mixing. But uniformity both of mixture and of temperature are most important. The general outside appearance of a kettle of this sort is shown in Fig. 2.

By blending the coconut oil with other less saponifiable substances, such as tallow or cottonseed oil, and effecting the mixture at a somewhat higher temperature, soaps are obtained which resemble milled toilet soaps.

Soaps made by this process are especially interesting to us as gas men, as they are often made in relatively small quantities and gas is an ideal fuel up to batches of 15 tons or so, although it is to be doubted if much work of this sort has been canvassed in spite of this fact at the present time.

Boiling

Soaps made by this process contain the gylcerine originally present in the oil, but in view of their liability to contain free alkali the process has been largely modified of late years. The details of such changes as have taken place are too wide to be considered here, but readers are strongly urged to visit the soap factories in their vicinity and learn at first hand some, at any rate, of these points. The time spent will not be wasted.

The process of soap boiling is also carried out in kettles of various capacities up to about 30 tons, or even more, although the average is considerably less. The upper part of the kettle or "pan" is usually surmounted by a cone or "curb" to provide for the foaming up of the boiling mass and to prevent loss from overflowing.

The old method of heating these kettles was by direct heat, but the general practice is now to use steam-heated kettles, although oil-jacketed (gas-heated) kettles can be used with or without a circulating system with great advantage, and chemists are gradually seeing the advantage of this system.

Autoclaves (see Fig. 3), in which the materials are boiled under pressure, are also employed for certain soaps.

Among the other soaps made are curd soap, mottled soap, yellow soap, settled soap, marine soap, silicate soaps, soft soap, toilet soaps, glycerine soaps, medicated soaps, etc.

Glycerine soap ordinarily consists of hard soap and glycerine. The soap is melted by heat, the glycerine (valuable for its emollient properties) is stirred in and the mixture strained and poured into forms, in which it hardens (but slowly) into a transparent mass (like Pears' soap). With excess of glycerine a third soap is formed, soap being soluble in that body, and such fluid soap has only feeble lathering properties. On the other hand, soap containing only small proportions of glycerine form a very tenacious lather, and these will be easily recognizable.

Redesigning Equipment

While atmospheric burners of special construction are most valuable for the conversion of soap kettles to gas, it is usually desirable to redesign the equipment in order to get the best results, and careful consideration should be given to the conditions to be met.

Regarding low temperature soap manufacture, the following is extracted from *The Chemist and Druggist:*

Opportunity for a Cauldron Furnace

Take exactly 10 lb. of double refined 98 per cent caustic soda powder (Greenbank), put it in any can or jar with 45 lb. (4½ gal.) of water, stir it slowly by gentle power, when it will dissolve immediately and become quite hot; let it stand until the lye thus made is cold. Weigh out and place in any convenient vessel for mixing exactly 75 lb. of clean grease, tallow, or oil (not mineral oil). If grease or tallow be used, melt it slowly over the fire until it is liquid and just warm, say, temperature not over 100 deg. Fahr. If oil be used, no heating is required. Pour the lye slowly into the melted grease or oil in a small stream continuously, at the same time stirring with a flat wooden stirrer about 3 in. broad; continue gently stirring until the lye and grease are thoroughly combined and in appearance like honey. Do not stir too long, or the mixture will separate itself again. The time required varies somewhat with the weather and the kind of tallow, grease or oil used; from fifteen to twenty minutes will be enough. A power-driven cauldron furnace (gas-heated) is ideal for this work. When the mixing is completed, pour off the liquid soap into any old square box for a mould sufficiently large to hold it, previously dampening the sides with water so as to prevent the soap sticking. Wrap up the box well with old blankets, or, better still, put it in a warm place until the next day, when the box will contain a block of 130 lb. of soap, which can afterward be cut up with a wire. Remember the chief points in the above operations, which must be exactly followed. The lye must be allowed to cool. If melted tallow or grease is used, it must not be more than warm. The exact weights of double refined 98 per cent powdered caustic soda and tallow or oil must be taken; also the lye must be stirred into the grease, not grease or lye

added to the lye. If the grease or tallow used be not clean or contain salt it must be rendered or purified previous to use: that is to say, boiled with water and allowed to become hard again to throw out the impurities. Any salt present will spoil the whole operation entirely, but discolored or rancid grease or tallow is just as good as fresh for soap-making purposes.

If the soap turns out streaky and uneven it has not been thoroughly mixed. If very sharp to the taste too much soda has been taken. If soft, mild and greasy, too little soda has been used. In either case it must now be thrown into a pan and brought to a boil with a little more water. In the first case boiling is all that is necessary; in the other instances a very little oil or a very little more of the double-refined powdered caustic soda must be added to the water. These things will never happen, however, if the directions are exactly followed, and after the soap has been made several times with the experience thus gained the process is extremely easy and the result will be always a good batch of soap. Beef tallow makes the hardest soap, mutton fat a rather softer soap; of oils, cottonseed is the cheapest and best, but the soap is much softer, lathering very freely indeed. Ordinary household fat or dripping will make a nice soap and in many places can be obtained at a very trifling cost, and in exchange for goods sold. Such grease, however, must be carefully examined for salt, which it often contains. It will be evident that any smaller quantity of soap can be made at a time, according to the above directions, by taking the ingredients in exact proportion. It is not advisable to make more than double the quantity prescribed, as it is difficult to work more by hand. By making successive batches, however, a single person can make 2 tons of soap in a day simply with apparatus (plans, etc.) obtainable in any household.

By adding a few drops of essential oil just when the mixing is completed a toilet soap is produced. Oil of mirbane (artificial almond oil) is the cheapest, but the perfume is not nearly so pleasant as real almond oil, citronella or oil of cloves. If made with clean grease or tallow or light colored oil, the soap produced is quite white.

Sometimes a little coloring matter will make the soap sell better, although of no better quality. Half an ounce of bichromate of potash ash dissolved in the lye will give a green; 1 lb. palm oil melted with the tallow or oil, a yellow color, or a good brown can be got by burning ½ lb. of sugar in a saucepan until black, then dissolving it in a pint of water and adding it to the melted tallow before mixing.

Kettle Over Gas Furnace

A very cheap and good jelly soft soap can be made with the above soap. Take 5 lb. of the hard soap, crush it down or cut it up into as small pieces as possible; put this into a pan or boiler with 10 gal. of water if a strong hard tallow soap; if an oil soap only half the quantity of water (5 gal.); just bring it to a boil, and stir well to thoroughly dissolve all the pieces of hard soap. (This can be carried out in a cauldron furnace or a kettle placed over a gas furnace.) Pour or ladle it into any can, tub or barrel that is tight, and leave it to cool for two or three days. This will give about 80 lb. of jelly soft soap at an exceedingly small cost. Of course if made from colored and scented hard soap it will be a colored and scented jelly soap. This is a good way of working up the scraps and bits of soap after cutting up. It can be sold with a good profit at a very low figure, and often as a substitute for regular soft soap. It is a very different article, however, to a real potash soft soap, which should invariably be used for washing woolens. It is possible to produce this real potash soft soap in the cold by a somewhat similar process to the above.

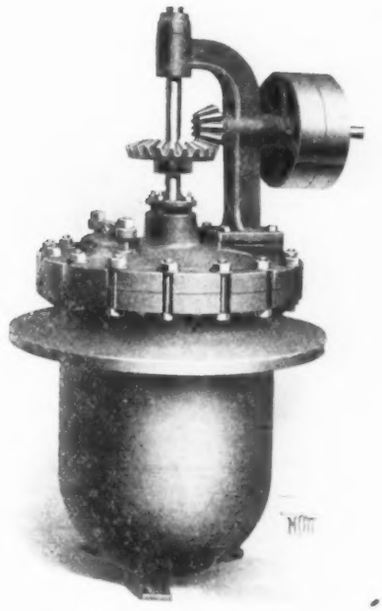


FIG. 3—AN AUTOCLAVE

Boiling Soap.—The Paste. This operation is to produce a preliminary combination of fat and lye. Some soap makers use during the whole operation a lye of the same strength, while others commence with a weak lye, then use one of middle strength, and finish with a strong one. In the first case, a lye is employed of 10 to 15 deg. Be. In the second of 7 to 10 deg., 15 to 18 deg. and 18 to 25 deg Be., successively. In some cases, as for red oil soap, very strong lyes are employed, say of 25 to 30 deg. Be. Usually the fat is first put in the pan and then the lye is added. For the past operation no lyes should be used containing foreign salts, such as are found in inferior kinds of soda, for it is then very difficult to form a union of the fats with the lye, and no good sud is obtained. But when the soap has been separated from the lye by salt, lyes containing salt may be used. In saponifying red oil, salty lyes may also be employed from the beginning. It is imperative in all operations that the lye should be caustic, because carbonate of soda will not unite with fat. For transforming 100 lb. of fat into soap about 14 lb. of caustic soda are necessary, but generally more is employed, because the soda used is never a pure hydrate of soda. The quantity of lye taken is also differently regulated by the manufacturers. Some add the whole amount of lye at the commencement, others add it gradually in small quantities. This last mode is preferable. From time to time, in order to test it, a drop of the paste should be put on the tip of the tongue, when, if there is still free alkali in it, a burning sensation will be produced, in which case the boiling must be continued until the soap

gives a sweetish taste. More lye should then be added, under constant stirring, until the entire quantity is consumed. At this stage the contents of the kettle are transformed into a homogeneous, clear liquid, in which neither lye nor fat can be dissolved. If the liquid is perfectly clear, it shows that the right proportion of fat and lye has been applied. Should saponification progress too slowly, a weak lye of from 1 to 2 deg. Be. may be added, and soap scraps will facilitate the combination of the fat with the alkali. By heating with an open fire it sometimes happens that a portion of the paste, when it thickens, sticks to the bottom of the vessel and burns. This is indicated by a black smoke passing off here and there with the vapor. When this occurs, the fire should forthwith be reduced and some gallons of the strongest lye added to prevent further mischief. By this means a slight separation of the soap from the lye is occasioned, and the contact between the former and the metallic surface destroyed. In all cases the paste operation is complete when, on taking out the stirring rod, the paste no longer drops from it, but slides down in long threads.

The Salting Operation

Cutting Up the Pan.—This is done by stirring into the ingredients of the soap kettle either soda lye containing salt or a solution of salt, or dry salt. The separation is founded upon the insolubility of the soap in brine or strong caustic lyes, whereas weak lyes would dissolve it. Of all soaps the coconut oil is the most remarkable, for, being dissolved by a brine solution, it is peculiarly serviceable for washing in salt water, whence its name, marine soap. This soap becomes so hard that when separated from the glycerine it cannot be cut with a knife, and consequently the salting operation should not be performed, but the soap boiled in strong lye with one water. The following is the method by which the salting operation is effected: One workman gradually adds the brine or dry salt, while another agitates the paste with a stirring rod from below upward. This is done under gentle boiling. It is essential to add the salt in the right proportion; the whole amount requisite should not be stirred in at once, but in portions of about one-sixth. After half of it has been dropped in, the soap should be allowed to boil for about ten minutes before any addition is made. According to concentration, 12 to 16 lb. of salt are necessary for 100 lb. of fat to separate the formed soap from the surplus of water. The separation is perfect when the aqueous portion is observed to run off from the curdy mass; when a sample is taken with a spatula, it is not of an adhesive character while hot, and when, on placing some in the palm of the hand and rubbing it with the thumb, it hardens into firm scales. The termination of the process is also indicated when the surface splits up into several fields, separated from each other by deep furrows, in which there is not the fresh and soft appearance of froth, but of dry slabs. The fire should be extinguished when the soap, hitherto covered with froth and bubbles, suddenly sinks and the froth breaks up into roundish massive grains distinctly separated from each other and from the saline solution. The salting being completed, let the mass remain quiet for several hours, and then the under lye may be drawn off by the faucet.

Principal Varieties

Clear Boiling.—This operation is to obtain hardness, consistency and complete neutrality of the soap. Commence to boil the paste gently with tolerably strong lyes. Some manufacturers proportion the quantity of lye to be used, and having put in the first boil for eight hours or so, then draw off the lye, put in the second, boil again, draw off, and so on. Should the soap during the intervals become too liquid, which may happen if a too weak lye has been applied, some handfuls of salt must be added, or the soap boiled with a weak lye containing salt. After each addition of lye, there should be, in taking up a portion by the spatula, some difficulty in running off the lye. Should this not be the case, water must be added, whereupon a quicker union of the alkali with the fat will be obtained. The process is terminated when large, regular and dry scales appear on the surface, and when these give elastic, brilliant, white scales and are easily pulverized by rubbing them in the palms of the hands. The soap should then be covered, left for some time, and eventually removed in the ladles.

Of the principal varieties are:

Almond Soap.—A toilet soap made of almond oil and soda.

Castile Soap, Spanish Soap, Marseilles Soap.—Soap chiefly imported, made of olive oil and soda. It occurs both in the white and mottled state, the former being said to be the purest, the latter the strongest. It is the hard soap (sapo, sapo durus) of the pharmacopœias. It is chiefly used in medicine and the toilet.

Curd Soap.—Made of tallow or suet (chiefly) and soda.

Mottled Soap (commercial).—Made of refuse kitchen fat (chiefly) and soda.

Naples Soap.—Made of olive oil and potash.

Olive Oil Soap.—Castile soap (vide supra).

Palm Soap, Palm Oil Soap, Violet Soap (commercial).—Made of palm oil and soda. It has an agreeable odor of violets.

Soft Soap.—1 (commercial). A dark, strong, fetid soap, made of whale, seal or cod oil, tallow and potash.

2. Soft Olive Oil Soap, Medicinal or Toilet Soft Soap.—Soap made of olive oil and potash. It is yellowish white, inodorous and of the consistence of thick honey. It is the soft soap (sapo mollis) of the pharmacopœias.

3. White Soft Soap.—Soap made of lard and potash. Only used in cosmetics and as a toilet soap.

Toilet Soaps.—Any of the preceding milder soaps, taken singly or mixed, and variously scented and colored.

Yellow Soap, Rosin Soap.—Made of tallow, rosin and soda. Palm oil, when cheap, often replaces the tallow, or a portion of it.

Agricultural Soap (whale oil soap).—Soda lye 30 deg. Be. one and one-half parts, whale oil foot three parts. Make by the cold process. Used for destroying insects on plants.

Mottled Soaps.—The mottled or marble appearance is usually given to soap on the large scale by watering the nearly finished soap with a strong lye of crude soda (preferably one rich in sulphides), by means of a watering pot furnished with a rose spout. In Castile soap it is given with a solution of sulphate of iron used in the same way. On the small scale, with toilet soaps, the mottle is either given in the way noticed under Savonnette, or, in a like manner, by combining some of the

soap colored at the time of scenting with the remaining uncolored portion.

The form of cakes, tablets, etc., may be given by either pouring the semi-liquid soap into a series of polished metal moulds or by cutting and moulding or stamping the soap in the solid state, it having been previously cut or formed into bars of suitable size and length.

Mottling.—If, instead of a white soap, the object is to produce a mottled soap, impure soda, containing sulphides, is preferred for the lye, and a quantity of ferrous sulphate (green vitriol), about 8 oz. for each cwt. of oil, is added at the end of the preliminary boiling. This is at once precipitated, partly as iron oxide and sulphide and partly as an insoluble iron soap. In consequence of this addition, and also from the presence of iron and sulphur in the lye and of ferruginous matters from the pan, the curd obtained at the end of stage 3 deg. has a uniform slate color. If this were allowed to remain the effect would not be pleasing; but instead of directing his endeavors to exclude these impurities, as in the case of the white soap, the soapmaker conducts the operation in such a way as to preserve and arrange them by diffusing the color in veins, in order to give a marbled or mottled appearance. When the proper consistence of the soap has been attained the mass is worked about with rakes, so as to bring the lower and darker colored parts of the curd to the top. When this has been sufficiently done, the viscid soap is transferred to the frames, where in about a week or more, according to the quantity, it cools down to mottled soap. By varying the proportion of iron sulphate added, a tint is produced of a lighter or darker hue. By exposure to the air the iron gets oxidized to the state of sesquioxide, and a reddish tint called Manteau Isabelle is diffused over the bluish mottled mass.

It is thus apparent that in mottled soap the veins and patches of heavy, insoluble, colored compounds are present because, by special manipulation, they have been intentionally prevented from subsiding, and by the conveyance of the soap to the frames in so viscid a condition that the downward trickling of the colored impurities should proceed so slowly as only to intensify the desired appearance and not subside altogether. It is evident also that, if a soap so prepared were thinned by admixture with water, the impurities would more readily subside, and that the veining or mottling would be greatly diminished or entirely prevented. Hence, a genuine mottled soap cannot contain more than 33 or 34, or at most 36, per cent of water. Hence, also, as a mottled appearance was formerly a special characteristic of Castile soap, and as this was essentially a good soap, a mottled or marbled character came to be regarded as a sign of excellence. So far was this belief carried that it used to be said there was no need to analyze a marbled soap, as it must necessarily be genuine. This, however, is not by any means the case.

A Limited Business

Regarding the manufacture of polishing soaps much could be written at this time. The gas man who is anxious to obtain limited business will find this field most successful.

The following is typical of the kinds of polishing soaps made:

Soaps, Polishing.—1. Mix 1 lb. oxalate of iron (calcined) with 5 lb. coconut oil soap.

2. Ten pound tripoli, 5 lb. of alum, 5 lb. white lead, tartaric acid 5 lb., and 100 to 125 lb. liquid coconut oil soap.

Specula, Polishing Powder for (Lord Ross).—Precipitate a dilute solution of sulphate of iron by ammonia in excess; wash the precipitate, press in screw press until nearly dry, then expose to heat until it appears a dull red color in the dark.

A simple direct-heated or water (or oil) jacketed cauldron furnace will provide one of the best appliances for making such polishing soaps. A gentle heat is all that is necessary, and the business is highly remunerative. The makers of these polishes will welcome real help from the gas man, who should give it.

Now is the time. Competitive days are coming, and the gas man must be prepared to meet them.

Careful Examination Where B.t.u. Standard Has Been Reduced Shows No Appreciable Increase in Individual Consumption

L. R. Nash, E. B. Powell and H. Vittinghoff Explain That Appliances Must be Adjusted to Leanest Gas Which Will Reach Them at Any Time, Consequently the Appliance in District Is Never in Position to Make Use of High Quality Gas to Best Advantage

Discussing fuel conservation as it relates to the gas industry, L. R. Nash, E. B. Powell and H. Vittinghoff, in the Stone & Webster *Journal* for September, point out various means of effecting economies in production.

In looking over the yields obtained by various companies under varying conditions we are at once struck by a great variation in results, they state. This variation is brought about by one of the following causes:

Quality of raw material.
Type of apparatus used.
Expertness in operation.
Quality of the gas produced.

It behooves the gas manufacturer under normal conditions to select that coal or oil which will allow him to produce the greatest amount of gas and coke for the least expenditure in money for raw materials. At the present time the producer cannot be the chooser, and he can select, if at all, from only a very limited variety of coals and oils.

The only thing to be said on this phase of the matter, therefore, is that the manufacturer must get as much of the most suitable qualities of raw material as he absolutely needs to manufacture the product necessary to supply his customers.

One of the very important causes for variation in efficiency is the type of apparatus used. Even under normal conditions it is rarely feasible for a company to scrap an old but serviceable piece of apparatus for a new one having a higher efficiency merely because of slightly better operating results to be obtained. In order to make such a change advisable the improvement in operation must be sufficient to at least carry the fixed charges on the value of the apparatus to be scrapped. At the present time improvement in operation and consequent fuel conservation by means of the replacement of old apparatus by new becomes still less workable, first, because of the enormous cost of manufacturing

equipment at the present time, and, second, because of the delay in delivery, and, third, because the installation of new apparatus would involve the question of taking away workmen and manufacturing capacity from industries more directly connected with the carrying on of the war.

Consolidation Likewise Not Feasible at Present

What has been said about replacing present apparatus also in a large measure applies to the question of consolidating a number of small companies into one, or at least supplying them with gas manufactured at one large central station. Normally this could only be worked out if it proved to be to the financial advantage of the companies, and at the present time the problem is further complicated by the question of time of delivery and the consumption of materials more directly needed for war purposes.

Methods of operation vary considerably in different plants, either on account of local conditions prevailing or else because of ignorance of the operating force of the best methods to be used in their particular case. It must, of course, be obvious that a large company can maintain a staff of expert operators to supervise the process of manufacturing which a small company cannot possibly maintain. The various national and sectional professional associations could be of material assistance here by opening a bureau and engaging experts to teach the operators of the smaller companies how best to meet their requirements. Some of the larger associations attempt to do this by means of correspondence, but in the present emergency this is not enough, and traveling experts ought to be maintained to do this work.

One of the most important factors in the effort now being made for conserving fuel is the establishment by the State or the municipality in which the company is operating of a proper standard of quality. The old candle-power standard is generally conceded to be unnecessary for the regulation of the service given by a gas company to its consumers, because only very little gas is now used in open-flame burners, practically the only case of the use of gas in which the illuminating quality it possesses is of consequence. On the other hand the performance of every incandescent lighting device or heating apparatus depends to a greater or less extent upon the heating quality of the gas. In some territories a very high illuminating standard has been maintained to date and in such cases it does not help the situation to simply convert the name of the standard by establishing a heating value standard, thereby establishing a requirement for quality of gas in terms of heating value, which is equivalent to the heating value possessed by the gas heretofore required to have a very high illuminating value. It is substantially true that a high candle-power gas carries with it a high heat value, and vice versa, although no exact ratio can be established between heating value and candle-power.

Consumption Not Appreciably Increased with a 40 B.t.u. Drop

In order to relieve the present fuel shortage it is absolutely essential that where high candle-power standards have prevailed they should be radically changed and a reasonable heating value standard substituted.

While the former candle-power standard required by the State of Massachusetts cannot be called excessive, the action of the board of gas and electric light commissioners in establishing a standard of 528 B.t.u. per cubic foot has allowed the companies operating in that State a material relief. It is of course apparent that if a similar standard were established in districts such as the cities of New York and Philadelphia, where exorbitantly high standards are now being enforced, the relief afforded those companies would be proportionately greater. On the other hand, there is to be considered the question of service to the consumer. It is reasonable to expect that where a gas company substitutes a low standard gas for a high quality gas the consumer, in order to obtain a given heating effect, must use a greater volume of gas; but experience has shown that while there is a certain relation between quality and consumption the relation is not one of simple proportion.

It is fair to assume that the companies in Massachusetts changing over from the old candle-power to the new 528 B.t.u. heat value standard on the average are now sending out gas having 40 heat units less than the gas formerly sent out. A very careful examination of the consumption per meter of a number of the larger companies does not show any appreciable increase in consumption, although it must be admitted that if the reduction in quality has been three or four times greater, an increase in consumption per meter would probably have become noticeable.

The explanation of this apparent paradox lies in the fact that a high standard gas must necessarily contain a large percentage of hydrocarbon vapors, easily condensed by exposure to cold. From this it follows that although a company might be sending out a high candle-power or heat value gas as measured at its works or testing station, this gas in transmission would have condensed out of it the most valuable portions before reaching the distant consumers' appliances, so that the consumer would really be getting a lower quality gas.

When the manufacturer of gas, on the other hand, sends out a relatively low standard gas its proportion of fixed gaseous constituents is very high, and the proportion of easily condensable hydrocarbon vapors is so low that the gas distributed does not deteriorate materially before reaching the consumer.

Relation of Adjustments

Every gas-burning appliance has to be adjusted for a gas of certain quality. If adjusted for a lean gas it will not properly burn a rich gas. If the adjustment has originally been made for a rich gas it is impossible to operate it on a poor gas; since in an appliance adjusted for gas having a high proportion of hydro vapors, as rich gases always contain, the flames burning at the orifices of an atmospheric or bunsen type of burner, which is almost invariably used in connection with gas-burning appliances, would flash back when a lean gas requiring a smaller admixture of primary air is supplied, and the gas would burn inside the burner, seriously damaging the same and, of course, making it impossible to use the appliance without a readjustment. It therefore follows that the consumer's appliance must be adjusted for the leanest gas which normally will reach it at any time, and therefore the appliance is never in the position to make use of the high quality gas to

best advantage when such gas is delivered to it.

Summarizing, it may be said that the efficiency of utilization is very much greater in the case of a low heat value gas than of a high heat value gas.

A reduction in standard will, of course, result in a direct, if not proportional, reduction in the quantities of coal and oil required for the production of a stated amount of gas. It is rather difficult to establish an exact ratio between the increase in yield of coal gas from a pound of coal with the reduction of the standard of, say, 50 B.t.u. per 100 ft., but it is probably not overstating the fact that under any condition a coal giving 5.5 ft. of 560 B.t.u. gas would, if the standard were reduced, produce 5.75 ft. of 510 B.t.u. gas.

In the manufacture of water gas a much more definite relation can be established. Steam and coke or anthracite coal, forming the basic constituents of water gas, would not be saved, but oil, which produces about 100,000 B.t.u. per gallon, could be reduced proportionately to the reduction in standard, so that for every hundred B.t.u. which the standard is reduced a gallon of oil per 1,000 cu. ft. of gas manufactured could be saved. At the present time various companies in different parts of the country use all the way from 2½ to 4½ gal. of oil per thousand. In Massachusetts it is probably safe to say that on the average companies manufacturing water gas use from 2¾ to 3¼ gal. per thousand. Few companies use materially less than that, and many companies, among which are the biggest in the country, use a materially greater amount. It would not be difficult to determine from statistics undoubtedly in the hands of the Fuel Administration at the present time what saving in oil would result if all companies manufacturing water gas were prevented from using more than 3 gal. of oil per thousand.

As it is impossible to distribute a uniform high standard gas, the manufacturer at the present time is constrained to allow a wide margin of safety in order to meet at all times the State or municipal requirements. When a low standard is established he is in a position to operate with a very much closer margin, and attention should be drawn to the fact that close regulation of the manufacturing process is not only possible and desirable, but also necessary from a fuel conservation point of view.

When referring to a low standard gas in this discussion a minimum of 450 B.t.u. or a maximum of 550 is referred to. The difficulty with distributing a very low standard gas, such as producer gas, having perhaps 125 B.t.u. per cubic foot, or even uncarburetted water gas containing 300 B.t.u., lies in the fact that such gases cannot be burned in existing appliances, nor could the distribution systems, consisting of mains, services and meters, as at present installed, carry the great increase in demand which would result.

In general it may be said that from a fuel conservation point of view the substitution of gaseous for solid fuel will prove advantageous for cooking purposes and industrial processes largely on account of the facility of control and consequent lack of waste. On the other hand, in connection with the heating of buildings, the fundamental fact must be borne in mind that a pound of coal containing 14,000 B.t.u. will yield by process of carbonization only about 3,000 B.t.u. in gas and 6,000 B.t.u. in coke, a total of 9,000, which makes it apparent that such substitution cannot be made as a general proposition. Where, however, heat is required for short periods of time and in relatively small quantities distributed over a number of locations, gas may be advantageously substituted as a fuel for coal, coke or oil with a resultant reduction in the consumption of these raw materials.

How Accident Prevention Work May Be Carried on in Small Companies

Wills Machlachlan Also Points Out Some of the Pitfalls That Lie in the Way

Accident prevention in the small utility is entirely different from that of a company where the calling of a meeting of 100 or 5,000 employees is possible, declared Wills Machlachlan, accident prevention supervisor, Electrical Employees' Association of Ontario Hydroelectric System, in a paper presented at the recent National Safety Congress. In one you are dealing with a few employees at one time, in a more or less personal way; in the other you are dealing with a number and the psychology of the crowd is brought to bear.

I have by no means a complete solution to offer, and because I had no precedent to follow I have been forced to use for the most part the "cut and try" method and to a great extent to use my own judgment as to the particular method that would work out best in the individual case.

No matter what method is used there is one axiom that should hang over the desk of anyone in charge of accident prevention work—"Don't bluff!" If you are in earnest and mean exactly what you say, and act as if you meant it, men will follow you and you will have their support. If you are trying to put something over under the guise of accident prevention they will see it before you have finally decided upon the details and you will have done yourself and your men an injury and delayed the real work. Remember that you are working to save money for the company and to safeguard the service to your consumers, as well as to preserve the limbs and lives of your men for themselves, their wives and families, and for their country and its allies. Tell your men this and lay your cards on the table and gain their respect and support.

Interesting Small Companies

One of the difficulties of interesting the small company in accident prevention is the fact that accidents do not occur frequently in the same plant. This is quite true, but accidents or lost time per capita in the small plant is as large if not larger than in the large plant and the hazard is just as great. Also, in utility work accidents are not numerous, but they are severe. I think that I am safe in saying that if the manager of the small plant will sit down and make out a list of accidents and lost time due to accidents over a period of a few years he will fully realize his duty as far as the work of preventing accidents is concerned, just as much as will the manager of a concern employing thousands of men. His is the legal responsibility for the financial economy to the company; his also is the moral responsibility to his men and their families.

To successfully handle any work in a company it

must be put in the hands of someone who is an expert in that particular line. In the large company, accident prevention is the whole duty of one man or a staff of men. This is not possible in a small company, but there is nothing to prevent a number of small companies banding themselves together into an association for the purpose of accident prevention and employing someone to supervise the work—this has been done successfully and to the advantage of all concerned, the companies gaining the benefits of the wider experience of the supervisor than if he were engaged by but one company. Another plan that has worked out very successfully is to engage, on retainer, a supervisor who will give a certain portion of his time toward the work of the company. The supervisor may be one man or may be a firm or bureau.

In regard to the carrying on of accident prevention in a public utility, I feel that it should be in the hands of an engineer who has had experience in designing, construction, operation and management. I realize that this is usually a large order; but you are playing for the lives of men. I fully realize that many men engaged in this work are not engineers, but you will usually find that they have the advice of engineers. If you can combine all the qualities in one man I feel that you are in a stronger position. I also lay emphasis on experience; this, I feel, is important. A safety man will have to work with all departments and must be in a position to deal intelligently with their details. When you meet the line foreman, know the right way to put on his belt and spurs and know the details of line work and you have him with you.

In starting the work in a utility I would say the first thing to do is to go over the accident record for as many years as is possible and tabulate this under "Cause and Department" for accidents and lost time due to accidents, getting it on a per capita basis if possible. Next comes the physical examination of the plant. Let us assume a hydraulic development, under moderate head, with a transmission line and sub-stations. The intake should receive our first consideration. Is the dam safe? Should it be guarded to protect employees or the public? Is the stop-log winch O. K., or should the gears be protected and should men be warned in regard to danger from the winch handle if the chain is down during moving of winch? Then the racks need attention. A very good plan is to put a 4 x 6 along the edge of the platform, just over the racks. This gives the men a good foothold in icy weather. If men are working over fast-moving water they should have life lines, and at least life buoys and pike poles should be handy.

Hazards in the Power House

Next let us go into the power house, taking up first the turbine equipment. The belts driving the governors and oil pump, if any, should be guarded by a wire mesh guard; the fly balls and small gears on governor should also be guarded. Then, if the turbines are driven by crown gears these should be enclosed. Safe access to all bearings should be assured. Guard rails should be put around the generators, and any exposed leads guarded. I mean here, guarded and not insulated. Next the switching equipment. Are there disconnecting switches between the oil switches and the busbars and between the oil switches and outgoing feeders? This is important for maintenance work. Can all fuses on meter transformers be easily got at? Switches should be plainly and distinctly named, preferably front and back of the board. Rows of disconnecting switches should have distinguishing mark between different switches, and the name of the switch should be placed in such a position that when the operator reaches with his switch stick for the switch he will see the name. If disconnecting switches are at all cramped, baffles of asbestos board or its equivalent should be between blades. In the lightning arresters there should be disconnecting switches between them and line, and barriers between different banks of arresters. If the tanks are not grounded they should be screened and screen grounded. One rather important point is to guard the operator, in throwing a disconnecting switch, from stepping back into live apparatus.

An important point in design, but rather hard to put in force in a finished plant, is to arrange two means of exit from behind all switchboards, switch galleries and from all switch cell structures. This is to give the operator a chance in case of a short-circuit.

The next point is the miscellaneous equipment. All belts and gears should be substantially guarded, stairways should be safe and passageways all lighted, and tools should be examined and all burred sledges, drills, etc., dressed. Rubber gloves should be examined inside and out, and usually condemned—our practice is to use buckskin covers over rubber gloves. This is for mechanical protection.

In telephone arrangements in systems using high tension the operators and patrolmen must be protected. This can be very well taken care of by use of the insulated stool or cabinet, also by training operators in the correct way to use the receiver to guard against deafness from severe noise. In arranging the lighting, attention should be paid to the safe renewal of lamps and fuses. Many designers seem to forget this, and place lamps and fuses dangerously near high-tension apparatus.

Transmission Lines

We will now go over the transmission lines with the patrolmen. Is there a provision for grounding the line just outside the power house? This should either take the form of grounding switches, grounding clamp or a ground chain. Patrolmen should carry either two sets of grounding clamps or two ground chains. Personally, I have grave doubts as to the effectiveness of ground chains; but on some systems of patrol grounding clamps are too heavy to carry. Now let us look at the switching tower. If it is supplied with a platform the platform should be railed and a toeboard provided. Some systems are now putting in switching towers with switches operated by a chain or rod mechanism; this should be grounded and provision made for looking in both the open and closed positions, both of which should be clearly designated, the switch, of course, having its name or number clearly shown.

Coming now to the sub-station, we will check up the grounding provision, disconnecting switches, etc., as in the power house. It might also be well to try to get into the sub-station without using the key, to make certain that all windows, doors, etc., are locked. If the sub-station has an attendant, and if in the summer season doors have to be left open for ventilating purposes, he should be supplied with wire doors that are locked. One hazard in sub-stations that is often overlooked is the necessity of using a stepladder to read transformer temperatures. One way of eliminating this hazard is to make a periscope by the use of two good mirrors and a length of fiber conduct. In sub-stations having no regular attendant more care should be paid to protection of apparatus than in attended stations. This is because an unskilled person is often required to go into these stations, at intervals, to change meter paper or to do simple switching.

In the foregoing I have just touched the high spots of physical examination of the plant. If it is a steam plant the same general scheme can be carried out, particular attention being paid to tools in the boiler room. Another point that should be noticed could well be called "good housekeeping." A clean, well-organized plant usually makes for the elimination of accidents.

First-Aid Kits

Every utility, no matter of what size, should be well equipped with simple first-aid outfits. For the utility in a position to call a doctor within a reasonable time such first-aid kit should be very simple; it might contain boracic acid tablets, ginger tablets, carron oil, aromatic spirits of ammonia, iodine (either in the bottle or preferably in ampule form), castor oil for the eye, some gauze bandages, some triangular bandages, plain or boracic gauze and absorbent cotton. For cleanliness the packages should be small in size or arranged that a small quantity can be removed without soiling the rest. This outfit should be in a compact case and should be regularly inspected. Very simple instruction as to how to use each part of the outfit should be prepared, also instruction as to how to handle a cut, bruise, hemorrhage or the more usual injuries. This set of instructions should also contain, in a very brief way, the more important points of resuscitation. If these instructions are prepared in inexpensive form, a copy should be given to every employee and a copy kept in the first-aid kit. In general, as far as first aid is concerned, make the kit simple and have the instructions as simple as possible, so as not to confuse the average employee and not to give the man an idea that he is an amateur doctor. My own instructions have always been that the best kind of first aid is given by a competent doctor, and any time wasted in putting on fancy bandages is almost criminal.

Gloves and Tools

Reference was made above to the question of rubber gloves. Arrangements should be made for the regular inspection and testing of rubber gloves. I do not want to take up your time here with details. They may be found in the report of the accident prevention committee of the N. E. L. A. Provision also should be made for the inspection and maintenance of linemen's belts and spurs. I do not think that any harm would come of making a regular practice of monthly warnings to linemen to use their safety belts. Most of us know of cases where a lineman has received a slight shock, enough to unsteady him on the pole, and in falling he has broken his neck. Committees are working on a correct design of linemen's belt, and it is hoped that a recommendation will soon be made public. I am recommending to linemen at the present time that they shall not use hand axes; they claim, however, that it is difficult to get a hammer of sufficient weight to do the work correctly; this, however, I feel is a detail that can easily be worked out. The danger of a falling hand axe should be done away with if at all possible.

The question of inspection of and dressing of sledges, drilling bars, etc., was touched upon briefly before. This is extremely important, as a burr from a sledge or drilling bar is very liable to cause the loss of an eye. A regular day should be appointed for going over these, too.

While on this subject it is naturally suggested that the use of goggles be enforced. Their use has, on countless occasions, saved an eye, and they should be supplied and their use enforced as rigorously as possible. It is also desirable to supply goggles that will protect the eyes from an electric flash. These should be non-inflammable and non-conducting, and should be as clear as is possible to have them, with due regard to being opaque to ultra-violet rays. This can be done without using the dense glasses used in electric welding. Men should be obliged to wear these glasses in doing any work that might occasion a bad flash, such as changing of fuses, working close to a commutator or pulling a disconnecting switch with a short stick.

Fire-fighting apparatus should be supplied and rigorously inspected. Fire pails should be protected from being used as spittoons. I have found a very desirable method of doing this by pasting manila paper over the tops of the fire pails. In using tetrachloride fire extinguishers men should be warned against the danger of chlorine gas in confined places.

As far as the physical plant is concerned, ample provision should be made to allow sufficient space to operate the plant safely; tools and other pieces of apparatus should be regularly and systematically inspected, and repaired when necessary. If these two general points are carried out a great number of our accidents will be prevented.

Resuscitation

Having now covered the physical plant, our most important consideration should be the obtaining the interest of and training of employees. First and foremost, in any public utility, is the training of every employee in the prone-pressure method of resuscitation. This can well be carried out as follows: A few of the employees can be gotten together and, with one as a patient, a demonstration of the method given, explaining each point in detail. The men to whom this has been demonstrated should

then be paired off and told to try to carry out the method of resuscitation that has been shown them. Most of them will have their hands in the wrong place and will carry out the resuscitation too quickly. They should then be required to practise resuscitation weekly for about two months, and then once every two weeks, as a part of their regular duties. Records of these practices, together with the names of the men, should be kept with the regular records of the company. After the men have been practising for some time they should be taught to take their hands off the patient's back when they swing back on their knees. A good plan also is to have one man fall, as if he had received a shock, and curl into any position he wants to; the operator should then see how fast he can get him into position and give him the first stroke. This should be done easily in eight seconds or less. I have trained some hundreds of employees in this way, and they have resuscitated men receiving shocks up to 60,000 volts.

Even in the small company it is quite possible to have meetings of the men. These can be informal talks, and if a blackboard is provided a great deal of good information can be given to the employees if the manager or superintendent will enter into the work. As a basis of these talks or meetings, some correspondence course as provided by the N. E. L. A. or various correspondence schools is useful, but a frank discussion of the various features of the plant, together with new ideas that are coming out in the technical press from time to time, will be of considerable interest to the employee. Along with this talk on general matters, instruction in and discussion of accident prevention matters can well be taken up. Another important point that should be discussed is the grounding of and taking grounds off the line or apparatus, the putting of a piece of apparatus or line into service or taking it out of service, and the routine of changing shifts. If the company has operating rules these can well be discussed, as it is my experience that in a number of cases operating rules are not understood by the employees, and therefore are not lived up to. Where informal meetings of this type are held regularly it has been my experience that the men will show far more interest in their work, develop into more skilled workers, and be more receptive to information along accident prevention lines. At these meetings the men should be encouraged to put forward suggestions for the prevention of accidents, and if they are found to be at all good the company should put them into effect, showing that they are heart and soul with the men in their attempt to prevent accidents.

Bulletins

Bulletins as prepared by the National Safety Council and by other organizations can be used judiciously, those pertaining to the work of the public utilities being very acceptable to the men and creating considerable interest. These should be shown on a regular bulletin board, and not too many put up at one time. The bulletin board should have a glass front, as some budding artist among the employees might make very disastrous additions to the bulletin.

To get the support of men in accident prevention work, it has been my experience that it is useless to go ahead until you have the wholehearted support of the foreman and others in charge. I would far rather take months to win the support of a foreman than to try to carry out accident prevention work with his men without his support. There is another type of man that should be won over—that is, the old employee who thinks that this work is a lot of bosh. In some instances I have taken almost unlimited time to try to find out what was the basis of his trouble and to correct that if possible. An ample stock of stories of accidents, with the resulting pain and suffering to the man and his family, often is very useful in winning over this type of man. These stories should be told to the man personally in a private conversation, and it is just as well not to argue with him before a number of his fellow-workmen.

This plan of work for the small plant can easily be extended to the larger plant, and I have found it very satisfactory to use committees in a plant having about 600 employees. These committees meet monthly and are started off with the foremen; they receive the suggestions of their fellow-employees, discuss them and pass them on to the executive heads for action. In this particular case there has been a reduction this year, as against last year, of 41 per cent of lost time due to accidents. I am quite willing to admit that one year's experience on this limited number of employees is hardly fair to put forward as a criterion, yet it shows the way the wind is blowing.

Accidents and the War

Let me make an appeal to the small plant owner and to the larger company, having men spread over a wide territory, to take up this matter of accident prevention in a serious and earnest way. Your country and mine are engaged in a prosecution of a desperate world struggle. We need every man possible at the front, and this naturally depletes those who operate in our power plants to supply the necessary energy for the manufacture of munitions of war and their transportation. Every day lost by a skilled employee delays or at least interferes with the successful prosecution of the war. It is your duty and mine to see that the operating force carry out their work in an efficient manner. This cannot be done when they are surrounded by unguarded serious hazards. It cannot be done as long as they do not realize the best and safest way for the prosecution of their work; and it cannot be done until you, your superintendents and foremen, earnestly throw your skilled experience and executive ability into the work of preventing accidents and training your men. This is not something that would be nice to do if we had time to carry it out; it is not something that need only be looked upon from the sentimental side; it is something that is causing you great needless expense, interfering with the successful and continuous operation of your plant, causing pain and suffering to your employees and their families, and interfering with the work of your country and her allies.

The Motorcycle and the City's Light

Latterly, through all the vast district of commercial Cincinnati which lies south of the Ohio River, in the neighbor State of Kentucky, and which, thanks to such other State lines cannot be annexed to same, the gas and electric lighting company of the Greater Queen City is utilizing the motorcycle for the important on-and-off work with which it is concerned.

In these days, when the midwestern communities not only light with gas, but heat and cook with it almost exclusively, the matter of getting meters turned on, so that folks may begin consuming gas at once, and of turning meters off ere the defaulting or others get the better of the company, are important factors indeed.

"To this end," Mr. Shafer, in charge of that phase of company work, tells us, "we maintain quite a fleet of motorcycles. We own the motorcycles, then apportion among the 'on-and-off' men, one to each.

"In addition, we equip every one of the motorcycles with side cars, these being used primarily for carrying tools and, occasionally, an extra gas meter and such like is taken along. Not only does the side car thus permit of use as might a cart or wagon, but, more important still, it prevents damage suits. That is to say, we find that there are far and away less accidents, both of folk dashing into the motorcycles or through drivers, filled with the zest of speeding along on the wheel, crashing into unexpected obstacles themselves, where there's a side car along.

"The men on the motorcycles work a nine-hour day.

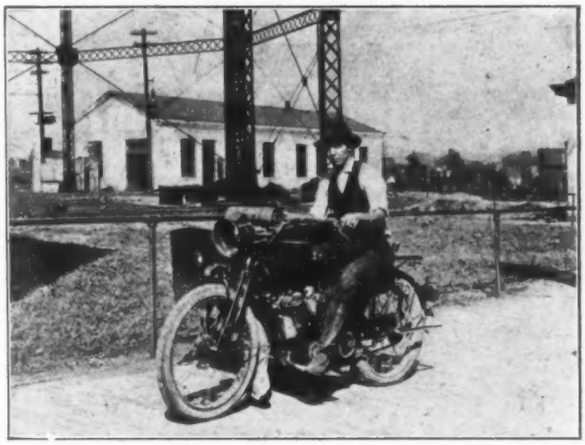
"Each man is given complete charge of his motorcycle and makes his own repairs. The company finds it cheaper and better to do this, paying the men four or five hours' overtime every so often, say for Saturday afternoon work on the cycle, than to run its own repair shop or contract with some garage for the repairs. Somehow, too, the men are more careful when they must do their own repairing, and need of such isn't nearly as likely to occur.

"Nor do the motorcycles find themselves spared in our work. Each man covers a minimum of 350 miles a week in the five and one-half days he works. It is not permitted to use the cycles for private ends on Saturday half-holidays or the Sabbath, and so these totals represent actual mileage on company ends.

"Sixty miles a day on a motorcycle regularly may not mean so much to a layman, but it's quite a ways when considered in the light of the work for us which it represents. On these 60 miles the man will make some forty-five stops at least.

"Most of these halts are for turning on the meters or for turning them off. If, however, several complaints in 'service' be in for the route over which the man is bound he attends to these; or, again, he is also detailed on such route to set a meter. In certain sparsely settled districts of the environs of town, where, may be, we don't set a meter oftener than once or twice a week, this task is delegated to the motorcycle man. The men are paid by the week, and so would as lief do this as any other things.

"Rides on the cycles extend, as a rule, to some 14 miles of the starting point; but on these rides every section of the town about is involved. All kinds of work, too, may present, and so for the side car a tool chest has been built, with handle to make it easy to carry into the house, and inside that all imaginable things are carried.



"For other hurried jobs the motorcycles are used as well; for example, it is a standby when calls come for leaks or in event of the fire alarm at company offices proclaiming a fire.

"Service without it would be badly off, indeed; so much so that the company looks with no more careful eye to any adjunct of its force than goes, day by day, to the machines and the men who constitute its fleet motorcycle corps!"

Publications

Advantages of a National Chamber Oven Plant

Folder; 4 pages; 9 x 12 in.; illustrated in colors. Issued by Russell Engineering Company, St. Louis, Mo.

A model of attractively gotten-up publicity matter. Outlines advantages of National Chamber Oven Plants to gas companies and defines value of services of the Russell Engineering Company.

Proceedings Wisconsin Gas Association—1918

Flexible-backed volume; 9 x 6 in.; 176 pages, illustrated. Published in Milwaukee by the Wisconsin Gas Association.

Contains in addition to the usual lists and other data the following papers presented at the convention:

"Progress Report on the Work of Wisconsin Gas Association Fellowship at University," by Prof. O. L. Kowalke; "Commercial Application of the So-called Surface Combustion Method of Utilizing Gas," by J. N. Cadby; "Some Aspects of Factory Lighting," by Robert ffrench Pierce; "The Recovery of Benzol and Toluol from Illuminating Gas," by F. E. Dodge; "Some Characteristics of Fireclay and Silica Refractories," by O. L. Kowalke; "Some Phases of Depreciation in Connection with Public Utility Rate Making," by Edwin S. Mack; "Regulation of Public Service Corporations," by William J. Hagenah, and "Presentation of a Case Before a Public Utility Commission," by Harold L. Geisse.

AMERICAN GAS ENGINEERING JOURNAL

SIXTIETH YEAR

Published Weekly by
AMERICAN GAS LIGHT JOURNAL, INC.
42 Pine Street, New York, N. Y.

ELBERT P. CALLENDER, *President*
STANTON G. KRAKE, *Vice-President*
FREDERICK A. SOUTHWORTH, *Secy-Treas.*
EUGENE C. MILES, *Editor*

Subscription $3.00 per year, including postage in the United States, Mexico, Cuba, Porto Rico, Hawaii or the Philippines.
In Canada, $4.00 . Foreign, $5.00
Single Copies, 10 Cents

WESTERN MANAGER E. B. FRITZ
CHICAGO OFFICE 587 So. Dearborn St.

Entered at the Post Office, New York City, as Second Class Matter.

CONTENTS

USE OF GAS IN THE MANUFACTURE OF SOAP AND SIMILAR COMPOUNDS. 313

CAREFUL EXAMINATION WHERE B.T.U. STANDARD HAS BEEN REDUCED SHOWS NO APPRECIABLE INCREASE IN INDIVIDUAL CONSUMPTION..... 317

HOW ACCIDENT PREVENTION WORK MAY BE CARRIED ON IN SMALL COMPANIES..... 319

THE MOTORCYCLE AND THE CITY'S LIGHT..... 323

PUBLICATIONS 323
Advantages of a National Chamber Oven Plant
Proceedings Wisconsin Gas Association—1918

EDITORIALS 324

HOW THE GAS COMPANIES ARE HELPING THE NATION 326

MOVIES THAT STIMULATE YOUR WORKERS' PATRIOTISM. BY ERNEST A. DENCH..... 327

SEES TIME WHEN STUDENTS IN COLLEGE WILL HAVE CLEAR UNDERSTANDING OF SAFETY PRINCIPLES AND PRACTICES..... 328

NEWS OF THE GAS INDUSTRY..... 329

PERSONAL NOTES..... 335

CONSTRUCTION NOTES..... 335

Germany Indeed Will Settle With America

"The American armies should not terrify us," declared General von Wrisberg in the Main Committee of the German Reichstag at Berlin. He added cryptically: "We shall settle with them."

They will.

To make sure that that settlement shall be entirely satisfactory to the civilized nations of the world opposed to Hun dominion, it will be absolutely necessary for the people of the United States to make the Fourth Liberty Loan a complete success.

The Huns must "settle" with America and the democratic nations by (among other things) unconditional surrender and agreements to restore, so far as it may lie in their power, the devastated regions of Belgium, northern France, Serbia and Roumania.

The "Fighting Loan" can be made a complete success only by the participation of all loyal citizens and residents of the United States.

At Cross Purposes

Attention has been called hitherto in these columns to the fact that the Fuel Administration for more than a year has been urging people to cook and heat wherever possible with gas. Recently a national association related to the coal industry beseeched the public to burn no coal for heating at least until Nov. 1. Wood and gas are suggested as alternatives in case the weather becomes too chilly to be borne.

The AMERICAN GAS ENGINEERING JOURNAL approves of both these activities. They are eminently logical and sane.

But we were informed recently that gas-heating appliance manufacturers were to cut their output in half. This by order of the War Industries Board.

Last winter the supply of efficient gas heaters was found to be generally inadequate. If the demand is no greater this winter than last, and the supply is the same, there must still be expected to be a deficiency. But, urged on by patriotic impulse and thoughts of safeguarding personal comfort and health, thousands more will be seeking gas heaters and there will be only half as many to furnish.

It would appear that the two governmental bodies are working at cross purposes. If those who want to heed his urgings cannot obtain the means of doing so, then the ink and white space the Fuel Administrator is using to urge heating by gas is being wasted. It would seem that this is a matter that should be looked into. The War Industries Board, we are certain, would not seek to nullify the efforts of the Fuel Administration unless there is no other way out. But if that way exists, it would be well to examine the matter more carefully while there is yet time.

The question of house heating under the climatic

conditions that exist throughout this country is of supreme importance in that it is an essential to our very existence. If it is necessary that hundreds of thousands be subjected to privation that in numerous cases may involve actual peril to life, then those privations must be borne. But this should not be necessitated through an error in judgment.

Seeking for Compensating Benefits

It is a simple task to find compensating benefits that make the money cost of this war cheap. The habit of thrift that is being instilled in the whole people of this country will alone yield returns that will make the liquidation of the vast loans that the nation is floating a simple matter. Few, however, seek compensating benefits for the thousands of lives that will be sacrificed. The effort is almost gruesome. A human life is precious beyond price. Only the attainment of the highest ideals can justify its extinction, and therein lies the answer.

We have been transformed in a short space from a nation rapidly drifting towards sordidness to a nation of idealists.

Selfish interests were rapidly engulfing us. The Government was a good government only when its enactments benefited our own particular interests. Otherwise it was composed of theorists and was "rotten."

We sympathized with the sufferings of the Belgians to the extent of contributing old clothes and a few superfluous dollars to their relief. But the majority would have balked if left to their own initiative at getting down to privations and risking their lives to insure it.

But in this short space we have been transformed. Men who would have welcomed impeachment of an administration that suggested a let down in the tariff item that protected their industry now see their businesses apparently destroyed beyond hope of repair, and of their own volition suggest further ways to tighten the thumbscrews, their main thought being the winning of the war. Young men who were vexed a year ago, not because they were being called upon to place their lives in peril, but at the interruption of their budding business careers, are to-day poking bayonets into foes who were hardened and skillful fighters when they had done nothing more aggressive than win a set at tennis.

And what is their attitude to-day—these men who have built up fortunes by years of hard work and now see them daily dwindling, and these young men who might have built up fortunes, but who must inevitably come back handicapped in the task? Do they think they have sacrificed enough already and look longingly towards the day of relaxation?

They could have peace to-morrow, and victory—of the old-fashioned kind, with bribes in the shape of territorial and economic concessions to delude them into the belief that they had accomplished something—if they desired it. But they insist upon going on. Bold, indeed, would be the statesman who suggested anything short of unconditional surrender as the solution of the present situation, for in the complete rout of the German ideal, these people who have sacrificed to their utmost see the gateway to an idealized world, an idealized mode of life.

We have become a nation of idealists, and in that will lie our compensating benefit for the lives that are and will be lost, the suffering that it will cost. He who deeply cherishes a worthy ideal stops not at any obstacle. Its attainment makes even the loss of life a sacrifice of not unbearable sting.

Overdoing It

We have been asked if we do not think recent editorials on the coal conservation possibilities of heating by gas might have an indirect effect in nullifying in part the efforts of the Fuel Administration to influence the public to make sacrifices in the way of heat comfort. One correspondent asks specifically if it is not possible that some citizen who has resolved to heroically bear the discomforts of mildly cold weather and have no heat whatever in the house until Nov. 1 might be induced to temporize under the lure of our suggestion that a single gas heater will require the consumption of very little coal relatively, yet will radiate a considerable amount of comfort?

Our answer is that we have never encountered any suggestion on the Fuel Administration's part that the public sacrifice its comfort in the matter of heat or in anywise jeopardize its health for want of it. He has asked the public to inconvenience itself slightly in not heating rooms not in use, and to hold the temperature of rooms in use down to 68 deg. But this isn't sacrifice. It is sanity.

Furthermore, we think the Fuel Administrator would greatly deplore a tendency on the part of anyone to misinterpret his urgings to the extent of impairing his working efficiency or imperilling his health, the health and work efficiency of the average citizen being a matter of very vital concern to the Government, of which the Fuel Administration is a part. Also the health of the average citizen's immature offspring—the little people who some day are going to be big and from whose earnings we are going to be repaid the sums we have invested in Liberty Bonds.

The question of house heating is too inevitably associated with health in our climate to permit of any far-fetched interpretation of fuel conservation urgings. The prevalence of the so-called Spanish influenza, a by-product of cold, is a case in point. We have had no real cold weather yet. Nothing to compare to what we

might expect by Nov. 1. Yet this miniature scourge has cost the war effort of the nation a great deal.

If the temperature of the average citizen's dwelling place is such that he must be about shivering after the day's work is done and his vitality low, we most urgently recommend that it be brought up to a point where he can sit down in comfort. Otherwise he might be afflicted with the grippe, or a bad cold at the least, and the country be deprived of his productive capacity for some days at a time when it cannot afford to support him in illness. It needs him at work. Our soldiers, it is true, are suffering discomforts that are greater than the will of the most Spartan civilian could force him to voluntarily sustain. But they wouldn't be if there was any humanly practical means of avoiding them, for it is known that for every discomfort he has to bear the fighting efficiency of the soldier is that much lower.

In conclusion we might repeat we have not encountered any suggestion from any responsible source that anyone deny himself warmth until Nov. 1, or any other date. We have seen urgings to avoid the use of coal until that time, but with the recommendation that wood or gas be used as a substitute.

How the Gas Companies Are Helping the Nation

L. J. Willien, of C. H. Tenney & Company, of Boston, Mass., is now a major in the Gas Defense Division.

W. B. Miser, manager of the Drumright division of the Oklahoma Gas & Electric Company, has been elected chairman of the local committee for the Fourth Liberty Loan drive.

Elmer Dover, vice-president of H. M. Byllesby & Company in charge of the Northwest Pacific Coast properties, has been elected chairman for Pierce County of the committee in charge of the United War Work campaign for the State of Washington. This committee will conduct a campaign during the week of Nov. 11 for the raising of funds for the war work of the Y. M. C. A., Y. W. C. A., Jewish Relief, Knights of Columbus, camp libraries and war work community service.

Miss Dorothy Ruth Dick, who for the past year and a half has been assistant instructor in the New Haven Gas Light Company's home economics department, New Haven, Conn., was given a luncheon by the company on Thursday afternoon, Sept. 26, on the occasion of her leaving the department to take the higher course in domestic science at Connecticut Agricultural College. Advertising Manager Philmer Eves, in charge of the department, briefly traced the evolution of the cooking school and contrasted the modern school and college equipment with the primitive conditions in the village cooking schools of by-gone days. At the public demonstration in the company's assembly room the same week, the large audience of housewives, cooks and students passed a resolution extending to Miss Dick an expression of good wishes with the hope that her career in the home economics field may always be attended with the same success and appreciation that has characterized her excellent work in New Haven.

William R. Miller, formerly general foreman of the Public Service Gas Company, Trenton, N. J., is now in the 307th Machine Gun Company.

Thomas F. Lupton, formerly employed by the Public Service Gas Company in the Rutherford, N. J., commercial office, is now with the Ordnance Department in France.

Louis J. Platt, industrial fuel representative of the Public Service Gas Company, Newark, N. J., who entered the Navy as chief machinist's mate, has been commissioned an ensign in the United States Reserve Flying Corps and detailed to the Balloon Gas Section, Bureau of Steam Engineering. He is in charge of the personnel, station operation, station supplies and hydrogen development for the Naval Air Station.

Private William H. Oelrich, a member of Company I, 113th Infantry (formerly old Fourth Regiment), was severely wounded in action Aug. 24. While a member of the old Fourth Regiment Private Oelrich went to the Mexican border. After the Mexican trouble, he went with the Fourth to Anniston, Ala., where he remained a month. From there he was transferred to Camp Stuart, Va., from where he sailed for France last June. Prior to entering the service he was employed as a clerk by the Consumers Gas Company, of New York.

Former Manager of Newburyport Gas & Electric Company Dies of Influenza While on Furlough

Frank C. Kidder, for three years office manager of the Newburyport Gas & Electric Company, Newburyport, Mass., recently died at his home, 253 High Street. He was taken sick with influenza and the trouble developed into pneumonia. Mr. Kidder was born in Lowell and was thirty-one years of age. Following his graduation at the Lowell High School he studied accounting and entered the employ of the Stone & Webster corporation. He went to Dallas, Texas, and other places in the interests of that concern, and returned East about four years ago to enter the employ of Swift & Company. For a time he was a member of the Ninth Deck Division of the Massachusetts Naval Militia, and was finally elected ensign, which office was not accepted. Mr. Kidder resigned his position with the gas company a few weeks ago on being appointed personnel officer in the United States War Department for duty at Washington, which assignment was later changed to Dayton, Ohio. He was on furlough of a few days when stricken by sickness.

LIEUT. GEORGE A. CAIN, of the 12th Engineers, formerly an industrial gas salesman for the Laclede Gas Light Company, of St. Louis, has just returned from the battlefront in France wearing gold stripes representing one year's service. He has been assigned as an instructor to one of the American training camps and his rank in all probability will be raised to that of captain when he assumes his new duties. Mr. Cain enlisted as a private. Among other bits of interesting news which he brought was the fact that the 12th Engineers, composed largely of St. Louis men, were used to maintain the communication lines of the advancing French and American troops in the St. Mihiel salient. In honor of his presence the gas company held a thirty-minute reception for Lieutenant Cain during business hours, in which all the employees gathered on the ground floor while the lieutenant addressed them on conditions at the front. On the following day the officers and department heads of the company gave Lieutenant Cain a dinner at the Missouri Athletic Association.

H. M. BYLLESBY & COMPANY, Chicago, Ill., has added three more stars to its service flag, representing Joseph Maloney, Walter Betz and Leo Sage, all of the accounting department, who have joined the Student Army, which becomes part of the United States Regular Army Oct. 1. The men have all left for Notre Dame University (Indiana), where they will receive special training. This makes forty men from the Chicago office now in either Army or Navy.

EDWARD BRIGGS, formerly in the rate department of H. M. Byllesby & Company, Chicago, who recently went to Camp Grant, has been promoted to regimental sergeant major.

LIEUT. ROBERT MONTGOMERY, of the 84th Division, formerly manager of the commercial department of the Louisville Gas & Electric Company, Louisville, Ky., has arrived safely in France.

J. F. OWENS, vice-president and general manager of the Oklahoma Gas & Electric Company, has been elected director of the Oklahoma City Chamber of Commerce.

Movies That Stimulate Your Workers' Patriotism

BY ERNEST A. DENCH

What is done with the money we invest in Liberty Bonds and War Savings Stamps? How are our contributions to the Red Cross, Y. M. C. A., Knights of Columbus and other charitable institutions used? What are the results of our efforts to conserve food, fuel, clothes and labor? It is only natural that we should desire to know how the boys "over there" are being backed up by our many sacrifices, and the gas company can perform a service to their country in this connection.

The newspapers and magazines are doing more than their share to keep those at home informed, but it is one thing to read such facts and quite another thing to actually see the accomplishments being performed. This the Government has realized in assigning a special branch of the Signal Corps to motion picture work. These official war pictures are released by the Committee of Public Information and reach exhibitors through the usual distributing channels.

In New York City it has been of common occurrence for the large department stores to buy out a theater for a single evening at which a big Government picture, such as "America's Answer" or "Pershing's Crusaders," was presented. The idea back of this was to show the hundreds of store employees what their Liberty Loan and War Savings Stamps contributions are used for, and thus inspire them to double or treble their future contributions. Such an undertaking is, obviously, out of the question for the gas company, but there is no reason why they should not inspire their workers to greater patriotic efforts by arranging that they see the official war films when they come to the local theaters. There are two practical ways by which the gas company can do this.

They can bring the films before the attention of the local chamber of commerce or their local association and leave it to either body to arrange with the local merchants to buy out the theater on a certain evening for the benefit of their workers and their relatives and friends. If a sufficient number of tickets are sold—it being left to the judgment of the employer whether he foots the bill for the tickets he has purchased or whether he charges them up to each individual worker—no doubt suitable arrangements can be made with the movie exhibitor at a cost not to exceed 10 cents a head. The town may be too small or too unorganized to secure adequate co-operation. On the other hand, the gas company may prefer to make a little family party out of it, commencing with a simple dinner, the principal feature of which being the exchange of work experiences. Such parties create good will among your force in that they remember your little treats when about to be attracted elsewhere by larger salaries. The next time a Liberty Loan comes around or donations for some patriotic fund are solicited or volunteer workers are wanted for patriotic duties, you will not have to practically coerce your workers into complying with your wishes in order to keep the public informed of the gas company's patriotic acts. You will find that such patriotic co-operation will come unasked for, and even a little in advance of your plans, thanks to the motion picture's propaganda work.

If, like thousands of other patriotic concerns, you are giving Thrift Stamps as change and selling Liberty Bonds as each loan is issued, you can increase your patriotic efforts in this connection by bringing to your customers' attention how their money is spent. With each $5 worth of Thrift Stamps offer two complimentaries, good for the official war picture at the local theater. With each $50 Liberty Bond offer a complimentary ticket good for all the official war pictures as they are shown locally.

To stimulate business offer an official war film show ticket with every gas appliance purchase.

The arrangements you make with the local exhibitor will depend entirely on local conditions. If he is having a hard time to get the people to see official war pictures because they have Charlie Chaplin and Mary Pickford tastes, he will be tickled to death to secure your co-operation, and will probably let you have the tickets at an especially low rate—perhaps a nickel apiece in quantities. In a better class community, where educational pictures are appreciated at their full worth, you may be obliged to pay the full rate and you may also

experience difficulty in securing the theater one night for your particular purpose.

But if you are in a town where the exhibitor never books the official war pictures except the extracts shown in the animated weeklies, get after that exhibitor. If he is pro-German, there is little hope except local public opinion. But if it is because he is not enough of an American to risk showing the official war films at a loss, trot out your co-operative plans.

It may not be the right thing to boast of one's patriotism, but the gas companies cannot keep theirs under cover, because if the public is uninformed of their patriotic acts they will jump to the conclusion that they are doing nothing to win the war. There is a happy medium, of course, and the gas company should endeavor to strike it. About the best source in this connection is the local newspaper, for what goes into its columns is news, and news in a newspaper is not forced any more than is news given publicity by circulars, posters, car cards and the like.

Sees Time When Students in Colleges Will Have Clear Understanding of Safety Principles and Practice

David Van Schaack Deplores Fact That Safety Measures To-day Are Largely in Nature of After-Thoughts

"Safety measures as yet are largely of the nature of after-thoughts," declared David Van Schaack, president of the National Safety Council, in his annual address before the Seventh Annual Congress of the National Safety Council at St. Louis, Sept. 16, "and we must necessarily devote much of our attention to the remedying of the ills of to-day. If a place is dangerous, it must be protected. If machinery is built insufficiently safeguarded, guards must be applied. If a workman has careless habits, we must seek to overcome them. But while we are doing these after-thought things we can, and we should, keep actively in mind the fact that such conditions need not exist, that it is not necessary to build unsafe places and machinery, and that it is possible for the workman to avoid forming habits of carelessness.

"Steps have been taken looking to the introduction of safety educational courses in universities and technical schools. Conferences of representatives of such institutions have been held in both the East and the West, and committees appointed to further the work. A prospectus on the subject has been distributed to 500 universities and schools, and syllabi and safe practices leaflets are in course of preparation. While progress must necessarily be gradual, it is not too much to hope that the time will come, and in the not distant future, when not only will the students generally of these colleges and schools have a clear understanding of safety principles and practice, and recognize their great value, but those specializing in certain branches of engineering will be instructed in the features of safety applying specifically to their work in after life. The works managers of the future will be recruited largely from these men, as will those holding other supervisory and directing positions, and it will be of tremendous advantage to the cause of safety to have these men not only imbued with the safety idea but familiar with and accustomed to its practical application.

Education of Workmen of the Future

"In furthering education of the future workman into safety habits, progress has also been made. We are co-operating with the Federal Board of Vocational Education, which will insist upon safety and hygiene educational work in every secondary trade school to which it gives 'grants-in-aid' under the Federal act appropriating $22,000,000 to assist the States in promoting vocational education. The council is recommending the appointment of a safety-engineer teacher for the promotion of this work in State secondary trade schools, and is undertaking to supply the vocational educational boards with the information necessary to work out the course of instruction.

"The National Safety Council has had printed four school bulletins each month during the year (1,000 copies of each), and has distributed the majority of them through the school members, in public safety campaigns and to the many inquirers requesting help of this kind. We are meeting with steadily increasing success in introducing safety education into the public schools, and we hope to have safety courses made a part of the curriculum in the normal schools which train the future public school teachers.

Interest in Workman's Safety Not Confined to Plant

"On the material side of this basic phase of accident prevention a sub-committee on safeguarding machinery at its source has studied the problem carefully and has made a beginning of the work of bringing the maker and the user of machinery to a common understanding of what safety features should be incorporated into such devices at the time of their manufacture, so that after-thought remedies will be unnecessary. Let me urge all here to respond promptly and fully to any requests made of you for information about how you have to safeguard machinery you purchase. It is only by convincing the makers of machinery that guards must subsequently be installed that they can be induced to include them, as well as other features of safe construction, as parts of the machinery when building.

"We are all interested in public safety as industrialists as well as citizens. A workman killed or injured on the street, in a public conveyance or in his home is just as much a loss to industry as one killed or injured in the plant in which he works, and a community atmosphere of safety thought has a distinct reflex action upon the industrial safety atmosphere."

The Liberty Loan Arms Our Soldiers

The subscribers to the Liberty Loans have purchased for the War Department over $4,000,000,000 of ordnance—$1,000,000,000 was spent for artillery, $300,000,000 for automatic rifles, $100,000,000 for small arms, nearly $2,000,000,000 for artillery ammunition, and $340,000,000 for small arms ammunition; $100,000,000 was spent for armored motor cars.

It is estimated that $7,000,000,000 will be spent by the Ordnance Department this current year.

Iowa Falls Plant Destroyed by Fire

The gas plant of the Iowa Gas Company, Iowa Falls, Iowa, owned by the Iowa Falls Electric Company, was totally destroyed by fire. The origin is supposed to have been from sparks from a passing locomotive. Five hundred consumers are affected and many indusrties are crippled by loss of gas service. The company will rebuild.

Dividends Distributed Among Employees of Grand Rapids Company

The Grand Rapids (Mich.) Gas Light Company on Sept. 20 distributed to thirty employees about $6,000, the regular employees' dividend.

Pocatello Company Moves Into Larger Quarters

Owing to the rapid increase in business and the urgent demand for more commodious quarters, the Pocatello (Idaho) Gas & Power Company is moving from the Crow Hotel Building on West Lewis Street to the Fargo Building on South Main Street. The moving was in charge of Superintendent John Aleff, and the concern was permanently located the first of the month.

Byllesby Employees Participating in Fourth Liberty Loan Drive

Thirteen employees in H. M. Byllesby & Company's Chicago office are devoting all or a good part of their time to the Fourth Liberty Loan drive in various capacities. R. J. Graf, vice-president and secretary of the company, is vice-chairman of the engineering committee; J. H. Briggs, assistant manager of the bond department, is chairman of the bureau of information for the Chicago committee; O. G. Corns is a member of Mr. Briggs' committee; C. S. Packer, M. H. Sadler, W. J. Kerr and R. A. Wortman are captains of various teams in the trades division; J. W. Devereaux, F. C. Gordon, M. C. Wiley, A. L. Flynn and H. V. Coffy are members of the engineering team.

Empire Opens Branch in St. Louis

Owing to the successful results obtained by the opening of a branch purchasing office in Kansas City, H. H. Sloan, in charge of that department of the Empire Gas & Electric Companies, has decided to do the same in St. Louis. The scarcity of material necessary for the production and refining of oil made this arrangement necessary. E. A. Dittman, formerly of the purchasing department in Bartlesville, Okla., will be in charge at St. Louis.

Licenses for Gas Business

Those Exceeding $100,000 Annually Must Come Under Regulations by Fuel Administration — Order Effective Oct. 1

Regulations are being prepared by the Fuel Administration under authority granted by President Wilson for the licensing of persons or firms engaged in the transportation and distribution of oil and gas. The licensing plan becomes operative Oct. 1, and it was emphasied that all concerns coming within the provisions of the President's proclamation must obtain licenses b ythat date.

Specifically, the persons or firms compelled to obtain licenses are importers, distributors or marketers, and transportaters of crude oil, fuel oil, gas oil, kerosene or gasolene; manufacturers of fuel oil, gas oil, kerosene, gasolene, and producers, distributors and transporters of natural gas. Retailers of natural gas and of oil in its various forms whose business does not exceed $100,000 annually are not affected.

New York Lighting Companies Displaying Paintings of American Camoufleurs In Boosting Fourth Liberty Loan

Many thousands of New Yorkers who have never seen the enormous and grotesque paintings executed by American camoufleurs on the sides of troopships and other steamships, although these gaily decorated craft are continually coming into the harbor, are afforded an opportunity to see smaller samples of the work of these wonderful war artists every day during the Liberty Loan campaign. There is now no need for anyone to go to the waterfront to see these paintings, either, for they provide the chief features of interest of elaborate and cleverly conceived Liberty Loan displays shown in the windows of the lighting companies of Manhattan and the Bronx during the next three weeks.

Window displays in the interest of the new loan far excel anything in the line of patriotic window decoration the city has ever known, and the combined displays in the show windows of twenty-five main and branch offices of the gas and electric corporations form one of the most important and picturesque mediums for "getting the loan message across." The work of six well-known artists who are members of the Society of Marine Camoufleurs can be seen in six public utility company windows in widely scattered parts of the city, and take the shape of exceedingly striking scenic backgrounds for interesting collections of war relics loaned by the Liberty Loan Committee for the metropolitan district.

Alonzo Kimball, Morgan Stinemetz, T. D. Benrimo, John Whiting, Remington Schuyler and Fred J. Thompson are the six eminent artists who have painted these remarkable canvases, and an interesting feature is that they have done all the work on them in spare moments in between their hard efforts in camou-

flaging Uncle Sam's transports and much other important art work for the Fourth Liberty Loan. The half dozen show windows where their patriotic art work can now be seen are those of the Consolidated Gas Company, at No. 212 West Fifty-seventh Street; of the New York Edison Company, at No. 124 West Forty-second Street, No. 424 Broadway, No. 362 East 149th Street; of the United Electric Light & Power Company, at Broadway and 146th Street, and of the Standard Gas Light Company, at No. 32 West 125th Street.

Besides these six windows showing war souvenirs and specimens of the camoufleur's art, nineteen other sets of show windows of gas and electric companies throughout the city and its immediate suburbs are devoted to striking educational displays designed to stimulate patriotic spirit and a desire to buy Liberty Bonds "to the utmost." Great war maps furnish the chief feature in nine of them. Others show numbers of large painted canvases, devoted to appropriate subjects, provided by the Liberty Loan Committee. One noteworthy display is a set of sixty original drawings made by Herbert Paus, originally made to illustrate war stories in a leading magazine. A series of fine engravings and wonderfully lifelike photographs depicting scenes and incidents on the Italian front are included in these notable displays, as well as complete sets of army and navy equipment and many other things of absorbing war-time interest.

All told, the exhibits to be seen in the twenty-five lighting company show windows during the loan campaign would equip a good-sized military and naval museum and in addition show many things never seen in such a museum before.

Increase Granted Oklahoma Natural Gas Company

The price of natural gas to Oklahoma City domestic consumers will be increased 6½ cents per 1,000 cu. ft. beginning Oct. 1.

Gas rates in thirty-four other Oklahoma cities and towns, which receive their supply from the Oklahoma Natural Gas Company also will be advanced under an order issued recently by the corporation commission granting permission to the Oklahoma Natural to advance rates in order to meet the cost of contemplated extensions and improvements which are deemed essential to obtaining an adequate supply of gas.

The places other than Oklahoma City which are affected are Guthrie, Muskogee, Tulsa, Pond Creek, Yukon, Turley, Stroud, Wellston, Edmond, Arcadia, Midlothian, Hunter, Deer Creek, El Reno, Enid, Wagoner, Chandler, Claremore, Red Fork, Dawson, Davenport, Luther, Meeker, Kelleyville, Depew, Nardin, Lamont, Peckham, Porter, Haskell, Shamrock, Inola, Ramona and Coweta.

The new rate will be 35 cents per 1,000 cu. ft. for the first 200,000 ft., with 25 cents the minimum charge on the graduated scale, which affects only the large industrial consumers. A discount of 10 per cent is allowed on all bills which are paid by the tenth of each month. The present rate in Oklahoma City and in many of the other towns affected by the order is 30 cents per 1,000, but with a discount of 5 cents per 1,000 where the bill is paid by a certain date each month, the rate is 25 cents per 1,000.

Riverbend Gas Company Asks Higher Rates

The Riverhead Gas & Water Company, Parlier, Cal., applied to the railroad commission recently for a supplemental order increasing the rates for gas fixed by the commission last May. The company asserts that in spite of its most economical operation it has met with further increases in cost of fuel, and that from June 1 to Aug. 1, this year, a net operating loss of $1,505 had been sustained. The company asks an increase of rates sufficient to meet what it regards as a net loss of $750 per month.

Protests Withdrawn in Laclede Gas Rate Case

Developments at the public hearing on the petition of the Laclede Gas Light Company, of St. Louis, to the Public Service Commission of Missouri for permission to increase its rates for gas service by 15 cents per 1,000 cu. ft., indicate that the increase will be authorized.

The hearing was held to give protestants an opportunity to refute the gas company's arguments for the rate increase. Two such protestants appeared, City Counsellor Daues, for the city of St. Louis, and a delegation representing the coffee roasters of St. Louis. When the story of the gas company had been told on the witness stand by General Manager Evans and Auditor Bulfin, of the gas company, both the coffee roasters and the city counsellor withdrew their protests. The latter, however, reserved the right to submit to the commission any statistics that he may be able to furnish in opposition to the gas company's request for increased rates before the commission renders a decision. He also asked the commission for an order requiring the gas company to file a report showing its earnings and expenditures over the last five years, and the acquisition of new property. The officials of the company readily agreed to supply this information.

The commission announced it would hold no further hearings on the matter unless it was found necessary to obtain additional information. The remonstrances against granting of authorization for the increase were withdrawn following the testimony of G. B. Evans, general manager of the gas company.

Mr. Evans submitted a table of figures showing that the increased cost of gas coal, fuel coal, oil, labor, taxes and interest for the current year over 1917 would amount to $931,022. To this, he said, should be added from $50,000 to $100,000, representing the increased cost of doing business in other departments. The company estimates that the 15-cent increase will barely counteract this increase. The present rates of the Laclede company are 45 to 75 cents per 1,000 cu. ft., according to the amount consumed.

Mr. Evans placed a valuation of $40,443,150 on the plant. He estimated the gross earnings for 1918 as $2,876,680, an increase of $153,049 over 1917. The payroll, however, increased $393,541 during the year.

Newburyport Company Allowed An Increase of 40 Cents

The Newburyport (Mass.) Gas & Electric Company, which petitioned the State gas and electric light commission for permission to increase the price of gas to consumers from $1.40 per 1,000 cu. ft. to $2, both net, has been granted the right to charge $1.80.

The commissioners estimate that at the present cost of coal and the present scale of wages, operating costs for the current year will show an increase of about $15,000. The

A GAS WAVE COMING OVER THE TRENCH, THE MEN USING THE "FLAPPER FAN" TO CLEAR THE TRENCH OF GAS. TRAINING AT CAMP KEARNEY, CAL. $250 INVESTED IN THE FOURTH LIBERTY LOAN BONDS WILL PAY FOR GAS MASKS FOR TWENTY AMERICAN SOLDIERS

need of further relief, in view of the facts, is manifest, and the price named hereafter is made to meet the existing emergency. If experience demonstrates that it is either too high or too low it should be reconsidered.

Coal Association's Secretary Warns St. Louis Dealers of Coal Shortage During Coming Winter

The coal dealers of St. Louis themselves were warned that a most serious shortage of coal during the coming winter is inevitable by Leo Romanski, secretary of the National Coal Jobbers' Association, in an address before the last meeting of the St. Louis Coal Club.

In order that his audience might fully understand why such a condition is inevitable, and also to reveal the problems facing the National Fuel Administration, Mr. Romanski made the following statements:

That he knew of a single group of munition plants where coal requirements were 1,500,000 tons a month and of another single plant that used 2,500,000 tons a year.

That for every ton of iron produced 5½ tons of coal is necessary.

That in order to supply all the demands for coal in the essential war industries here and abroad the United States would have to produce more coal than is mined in normal times by the combined mines of our Allies.

Chemical Industry Holds Successful Exposition

Complete Line of Machinery and Equipment for Chemical and Color Industry Shown by Exhibitors

The Fourth National Exposition of Chemical Industries was held in the Grand Central Palace, New York City, the week of Sept. 23.

It was the most successful as to the number of exhibitors and attendance that has been held. Three floors were occupied by exhibits and a complete line of machinery and equipment for the chemical and color industry was shown. A large number of the exhibits were operating ones.

The gas industry in many ways is so closely related to the chemical industry that it was well worth the time of gas men to visit same.

Amongst the exhibits of special interest to gas men were the following:

American Meter Company, New York; Brown Instrument Company, Philadelphia; Foxboro Company, Foxboro, Mass.; Koppers Company, Pittsburgh; Stevens-Aylsworth Company, New York; U. S. Cast Iron Pipe & Foundry Company, Burlington, N. J.; Thwing Instrument Company, Philadelphia; Bristol Company, Waterbury, Conn.; Precision Instrument Company, Detroit; Sturtevant Mills Company, Boston; B. F. Sturtevant Company, Boston; Uehling Instrument Company, New York; Walter Loomis Company, Boston; Schaeffer & Budenburg, Brooklyn; Life Savings Device Company, Chicago; Nash Engineering Company, Norwalk; Precision Thermometer & Instrument Company, Philadelphia; Taylor Instrument Company, Rochester; G. H. Elmore, Philadelphia; Air Reduction Sales Company, New York; Meek Oven Company, Newburyport, and Celite Products Company, New York.

THE PRAIRIE OIL & GAS COMPANY has declared the regular quarterly dividend of $2 a share, and an extra dividend of $2 a share, payable Oct. 31.

Commission Grants Increased Rate Asked by North Shore Company

The Illinois Public Utilities Commission issued an order authorizing an increase of 5 cents per 1,000 cu. ft. over its rates authorized Dec. 19, 1917, for general gas service in Waukegan, North Chicago, Lake Bluff, Libertyville, Area, Lake Forest, Highwood, Highland Park, Deerfield, Glencoe and Winnetka of the North Shore Gas Company, of Waukegan, effective as of Sept. 1.

The new rates authorized are:
First 2,000 ft., $1.30 per 1,000.
Next 3,000 ft., $1.25 per 1,000.
Next 5,000 ft., $1.20 per 1,000.
Next 10,000 ft., $1.15 per 1,000.
Next 10,000 ft., $1.10 per 1,000.
Over 30,000 ft., $1 per 1,000.

Oct. 17 Set For Hearing of Oshkosh Rate Case

The railroad commission recently fixed Oct. 17 as the date for the hearing on the application of the Oshkosh (Wis.) Gas Company for an increase of rates. The hearing will be held at Madison at 10 a. m. The company claims that an immergency increase of rates is necessary on account of the increase of expenses for coal and labor.

Higher Rate Asked by Middletown (Ind.) Company

The Middletown (Ind.) Gas Company, through its attorney, George W. Cromer, of Muncie, filed a petition recently asking for an increase in gas rates in Middletown. Proposed rates are $1.50 per 1,000 cu. ft. for the first 2,000 ft. and 75 cents per 1,000 thereafter, and a monthly minimum of $1.50. Present rates are $1 per 1,000 for the first 2,000 and 50 cents per 1,000 thereafter, with a monthly minimum of $1.

Hearing on Gas Rate to Be Charged by San Diego Company Set For Oct. 8

The city attorney's office has been notified that the State railroad commission will hear the application of the San Diego (Cal.) Consolidated Gas & Electric Company for permission to revise and increase gas and electric charges in the city of San Diego on Thursday, Oct. 8. Commissioner Henry D. Loveland will preside at the hearing. In addition to San Diego the cities of Coronado, National City, Chula Vista, La Mesa, El Cajon, East San Diego, Escondido and Oceanside have been notified of the hearing in order that they may have representatives in attendance.

Pacific Gas & Electric's Gross for August Shows Increase

Gross operating revenue of the Pacific Gas & Electric Company for August showed an increase of $56,564 over July and a gain of $41,539 over August, 1917, the improved showing for last month as compared with July being due presumably to the larger seasonal consumption. Total net income for last month, while greater than for August, 1917, was smaller than in July of this year by about $26,000, the decrease being due to a decline for last month in profits on merchandise sales and miscellaneous income. This item amounted to $53,190 in July and $32,632 in August.

Gross operating revenues for the twelve months ended Aug. 31 showed the customary increase over last year, but net earnings from the operation and miscellaneous income were lower, so that total net income for the period was smaller by $537,828. The preliminary income statement for the month and the period, issued recently, gives only the bare figures of earnings and expenditures and further information as to the effect of higher rates on gross income will have to await the issuance of a more detailed statement. The preliminary income account follows:

MONTH OF AUGUST

	1918	1917	Increase
Gross operating revenue	$1,991,396.60	$1,614,987.73	$376,408.87
Expenses, including taxes, reserves for depreciation, etc	1,444,841.01	1,109,971.59	334,869.42
Net earnings from operation	$546,555.59	$505,016.14	$41,539.45
Add profits on merchandise sales and other miscellaneous income	32,632.75	47,214.66	*14,581.91
Total net income	$579,188.34	$552,230.80	$26,957.54
Deductions—			
Bond and other interest	343,531.47	341,341.56	2,189.91
Apportionment bond discount and expense	15,426.41	15,426.41	.....
Accrued dividends on preferred stocks	124,450.02	123,933.29	516.73
Total deductions	$483,407.90	$480,701.26	$2,706.64
Balance	$95780.44	$71,529.54	$24,250.90

*Decrease.

TWELVE MONTHS ENDED AUG. 31

	1918	1917	Increase
Gross operating revenue	$21,369,519.88	$19,367,683.58	$2,001,836.30
Expenses, including taxes, reserves for depreciation, etc	14,381,164.08	11,919,055.08	2,462,109.00
Net earnings from operation	$6,988,355.80	$7,448,628.50	*$460,272.70
Add profits on merchandise sales and other miscellaneous income	476,854.21	554,409.47	*77,555.26
Total net income	$7,465,210.01	$8,003,037.97	*$537,827.96
Deductions—			
Bond and other interest	$4,129,476.61	$3,977,875.43	$151,601.18
Apportionment bond discount and expense	185116.92	181,078.06	4,038.86
Accrued dividends on preferred stocks	1,489688.68	1,460,334.54	29,354.14
Total deductions	$5,804,282.21	$5,619,288.03	$184,994.18
Balance	$1,660,927.80	$2,383,749.94	*$722,822.14

*Decrease.

Essential Industries Finance Corporation Organized

Essential Industries Finance Corporation has been incorporated under laws of New York with capital of $3,000,000 to aid in financing of public utility companies and industries necessary for prosecution of war. Eugene V. R. Thayer will be president and Frederick Strauss, of J. & W. Seligman & Co., one of vice-presidents. Corporation, as loans are made by it to public utility and other companies, will avail itself of provisions of war finance act by borrowing money from War Finance Corporation, rehypothecating notes and securities received by it in respect to advances made.

Laclede Company Preparing to Give Up Every Man the Government Needs, by Training Women to Replace Them

The Laclede Gas Light Company, of St. Louis, though it is engaged in actual gas work, is now going over its list of employees with a view of sparing for the fighting branch of the Government service every man who can possibly be replaced by a woman or by a man not subject to the draft. How eager the company is not to interfere with the operation of the draft is demonstrated by the fact that even the chemist in charge of the toluol department of the company's plant was permitted to enter military service without a claim being made for his exemption on industrial grounds. The Government, on its own initiative, transferred him to other essential work.

When interviewed on this phase of the labor situation, G. B. Evans, general manager of the company, said: "We are now going over our lists of employees and are getting ready to spare every man the Government needs. We are not having much trouble getting unskilled labor. Where we cannot get untrained men to replace those called to the colors, we are using women. We already have sent 170 out of our 1,400 men to war.

"Of course, some of our men are indispensable, and for them it will be absolutely necessary to ask exemption. It takes a long time to train men for some positions in a gas company. But we have found that we can put new men and girls under the few trained men that we retain, and in a short time have them trained to do what generally has been regarded as skilled work."

Seventh Annual Convention of the National Safety Council Well Attended

Well-Known Gas Men Elected to Directorate—Methods of Accident Prevention and Alleviation Discussed

The Seventh Annual Safety Congress held in St. Louis, Sept. 15-20, under the auspices of the National Safety Council, was without a doubt the best attended and most fruitful of all the previous conventions of the organization. This was true as much of the public utilities sectional meeting as of the convention as a whole. Though the discussion of accidents that might be referred to as "gas accidents" was very scant, a number of the papers read at the public utilities section referred to methods of accident prevention and alleviation that can be practiced in the gas industry as well as electrical.

Among the most important of such papers were "A Practical Demon-

Meet Mr. Fornay---
J. A. FORNAY
We take pleasure in introducing to our gas customers our Mr. J. A. Fornay, who has been appointed superintendent of this department of our Charlotte business.
Mr. Fornay comes to us from Toronto, Canada, where he was connected with the Consumers' Gas Company for seven years. Previous to that time he was with the gas company at Houston, Texas and at Chattanooga, Tenn.
His experience has been wide and varied and we predict that his handling of our gas business here will be of a most pleasing nature to our patrons.
We regret to announce the resignation of Mr. Henry Collins, who has had charge of this department for many years. Mr. Collins leaves us to go into a larger field and our best wishes for his continued success go with him.
For Mr. Fornay we ask that same sympathetic co-operation which has been given his predecessor.
Southern Public Utilities Company

SOUTHERN PUBLIC UTILITIES COMPANY INTRODUCES NEW GAS SUPERINTENDENT IN UNIQUE WAY—ADVERTISEMENT WHICH APPEARED IN CHARLOTTE NEWSPAPER

stration of Resuscitation Methods," by H. B. Harmer, safety engineer of the Philadelphia Electric Company and secretary of the utilities section, and "Modern Practical Methods of Accident Prevention in Small Companies," by Wills Maclachlan, inspector of the Electrical Employers' Association of Ontario, Toronto, Canada.

C. E. Paige, manager of the Malden & Melrose Gas Light Company, Malden, Mass., was advanced from the post of vice-chairman to that of chairman of the section, succeeding C. B. Scott, general manager of the Bureau of Safety, Chicago, Ill. Mr. Maclachlan was elected vice-chairman.

Four men well known in the gas industry were elected to the directorate of the National Safety Council at the general meeting of members. They were: John J. Egan, president of the American Cast Iron Pipe Company, Atlanta, Ga.; E. H. Fiesinger, safety engineer of the Semet Solvay Company, Syracuse, N. Y.; Carleton Macy, president of the Queensborough Gas & Electric Company, Far Rockaway, N. Y., and E. R. Curtin, president of the Lima Natural Gas Company, Lima, Ohio.

David Van Schaack, of the Aetna Life Insurance Company, was re-elected president of the council, and the entire staff of the general office was elected.

The papers and discussions at the various sectional meetings and the general session were in striking agreement on one point, namely that accident prevention as viewed by the trained safety engineer consists of three-fourths educational methods and one-fourth mechanical guards. In the utilities section the sentiment was that the company had a double duty: first, to educate its own employees in the necessity for and methods of accident preventions, and, secondly, to so educate the general public insofar as the use of gas and electricity is concerned.

At this congress the matter of safety work among women and children received greater attention than at any previous gathering. In the utilities section an instance was described in which a man was resuscitated through the use of methods learned by a child at school.

The increasing use of women in gas and electric plants brought forth an interesting discussion on the successes and failures of recent innovations along this line. One of the delegates described how the company had launched an elaborate campaign to induce the wives and sisters of their employees to prepare themselves at the company's expense to do a man's work so that they might be able to fill the gap caused by an accident to a male member of the family or by his going off to war.

"Despite the fact that we offered a good wage and many other inducements, not a single applicant appeared to accept our offer," the speaker said.

Another delegate said the reason for that could be seen if one remembered that in most homes "dad has just about the biggest job on earth," and most wives and daughters would never think of trying to step into his place at the plant. It developed later that the company which had made this attempt learned the real reason for its failure was not any deference for "dad," but the activities of labor organizers.

At other sectional meetings the so-called vestibule plan of training women was hailed as a great success. The vestibule school enables the woman who undertakes technical or mechanical work to become familiar with her new job and surroundings without the embarrassment that comes from trying to learn under the eyes of a shop full of workers.

Increased Rate Sought for Springfield

An application for permission to put into effect a rate of $1.50 for gas supplied in Springfield, Mo., by the Springfield Gas & Electric Company was forwarded to the Missouri Public Service Commission. If authorized will supplant a net rate of $1 per 1,000 cu. ft., which is now in effect.

A table showing the increase of operating expenses and a decrease of gross income is filed with the application. According to this record the company's gross earnings have decreased during the past five years from $149,895 to approximately $132,613. During the same period the operating expenses have soared from $83,543 per year to $130,915. This indicates a loss in the gas department without consideration of interest on investment, taxes, depreciation and other expenses.

The price of coke and gas-making oil was nearly doubled at the beginning of July of this year. These are two of the most important items of gas manufacture.

Another table shows that in spite of an increase in the number of gas customers the average consumption has been less each year. In 1911 the table shows 4,536 patrons used 139,128,800 cu. ft. of gas. In 1917, 5,265 gas consumers purchased only 144,311,000 cu. ft. of gas, or an average of 2,740 cu. ft. per customer. In 1911 the average consumption per customer was 3,067 cu. ft.

Utah Company Files Application for Increase

The Utah Gas & Coke Company, Salt Lake City, Utah, through General Manager G. H. Waring, has notified patrons that it has filed an application with the utilities commission for permission to make a 25 cents per month charge per meter, stating this increase is necessary to meet the advance in freight rates of 50 cents per ton on coal, effective June 25, together with an increase of 20 per cent in the gas works payroll, effective July 15.

The advance of charges for consumption of gas granted by the utilities commission June 1, he said, was insufficient to enable the company to make both ends meet, when freight rates and the payroll were increased —one by the Government and the other by the board of arbitration. Consequently, it was necessary to correspondingly advance the cost of gas to the consumer. Heretofore there have been 2,500 consumers who used less than a dollar's worth of gas per month, and the 25 cents increase will affect them more than large consumers, and will operate in the line of a minimum charge. Mr. Waring said all dividends had been suspended during the war, though after the war preferred stockholders would have this made up to them, while the holders of common stock were making an outright donation to war conditions.

Pennsylvania Companies Increase Rates to Industrial Consumers, Effective Oct. 16

The American Natural Gas Company and the Gilpin Natural Gas Company, operating in Allegheny, Armstrong, Butler, Indiana and Westmoreland Counties, Pa., have filed with the public service commission a new tariff of rates to become effective on Oct. 16, increasing the rate for natural gas supplied consum-

ers in Class 2, manufacturers and others using gas in large quantities. The new tariff increases the rates for service to the above consumers from 30 and 27 cents net to 35 cents for the first 500,000 cu. ft. per month and 30 cents net for all excess.

Increased Production of Coal Expected as Result of Fuel Administrator's Call

Greatly increased supplies of coal to meet demands of the nation's vast military program and to assure adequate supplies for domestic needs are expected by officials to result from Fuel Administrator Garfield's call for an increase of 16½ per cent in bituminous output and of 6 1/3 per cent in the anthracite output in six months.

The bituminous fields are asked for an average production of 12,234,000 tons weekly, an increase of 1,731,000 tons, and the anthracite mines are asked to average 2,030,000 tons weekly, an increase, as compared with the winter months of last year, of 121,000.

Maintenance of these quotas, Mr. Garfield said, "will give us all the coal needed this winter."

In his proclamation, issued recently and addressed to "all persons engaged in the mining of coal," every district production manager, every coal operator and every coal miner is asked to accept individual responsibility for production of his fair, proportionate share of the allotment to his district or mine under the weekly quota system.

Wartime Lighting Economies

Included in the program of the convention of the Illuminating Engineering Society to be held on Oct. 10 is the presentation of "War-time Lighting Economies," a treatise which has been prepared by the Committee on War Service and submitted to the United States Fuel Administration to serve as the basis of the Fuel Administration's propaganda for economy in lighting on the part of the public at large. It is hoped that the discussion of this non-technical, popular treatise will elicit additional ideas which will be of utility to the Fuel Administration. The treatise with its discussion on the floor of the convention will strike a timely note expressive of the desire of the membership to be helpful in the national emergency.

Advance copies of the paper, "War-time Lighting Economies," may be obtained upon application to the general offices of the society, 29 West Thirty-ninth Street, New York City.

Output of Rochester Company Greater Than Ever Before

The Rochester (N. Y.) Railway & Light Company recently had the largest sale of gas ever in Rochester. The month of September carries the maximum load of the year. This year the extensive canning of the fall fruits and vegetables and the use which many consumers have put gas heaters to in order to save the winter supply of coal for the more severe weather, has established a new record for gas consumption over other years.

On Sept. 10 the company sold 8,763,000 cu. ft. of gas, making an increase 1,721,000 cu. ft. over the sale recorded for the same day last year, and 1,039,000 cu. ft. more than the largest day's sale of that year. The number of customers that used the amount of gas sold on Sept. 10 was 80,000, which made an average of 110 cu. ft. for each customer.

If the 8,763,000 cu. ft. of gas mentioned above were used for cooking, it would be enough to prepare 438,000 dinners or furnish a light of 180,000,000 candle-power for one hour equivalent to 36,000 ordinary electric arcs. The new plant, which is working so successfully, started partial operation last January, and was in complete working condition the first of April.

Personal Notes

E. S. Estlin has recently been appointed natural gas commissioner for the Province of Ontario, with offices at Chatham, Ont. Mr. Estlin invites all advertisers who wish to be represented there to send any catalogs to him which they may care to.

D. T. Davis, of the law firm of Davis, Symmes & Schreiber, 55 Liberty Street, New York City, has been named counsel for the New York State Fuel Administration.

Henry Collins, who has had charge of the gas department of the Southern Public Utilities Company, of Charlotte, N. C., has resigned to accept a position with the Texas Company, 17 Battery Place, New York City. Mr. Collins has already assumed his new duties.

J. A. Fornay, who has been connected with the Consumers Gas Company, of Toronto, Canada, for the past seven years, succeeded Henry Collins as superintendent of the gas department of the Southern Public Utilities Company at Charlotte, N. C.

Nion R. Tucker has been elected a director of the Pacific Gas & Electric Company to fill the vacancy caused by the retirement, from the board of Norman B. Livermore, now a captain of engineers stationed on the French front.

H. E. Willer has been appointed manager of bituminous distribution for the State of New York. Mr. Willer was for many years assistant to the vice-president in the traffic department of the New York Central lines. During the last year he has devoted considerable time to army transportation affairs.

Construction Notes

Work Started on Second Munition Plant of Laclede Company

Work has begun on the second of the two great munitions plants to be operated by the Laclede Gas Light Company, of St. Louis, for the United States Government. This plant will cover a 10-acre tract adjoining the plant of the Scullin Steel Company, which will turn out the ingots that the Laclede company's plant will convert into 9½-in. shells at the rate of 4,000 a day.

At the office of the Fruin Colnon Contracting Company, St. Louis, which has the building contract, it was said the plant would be completed and ready for operation before the first of the year. The building contract amounts to about $500,000 and the equipment for the plant will run into the millions of dollars. J. A. V. Scheckenback, of the American Car & Foundry Company, Detroit, Mich., is the supervising engineer on the job, both for the building and the equipment. The purchasing of the machinery that is to go into

the plant has been in progress for some time.

Major Charles C. Chase, of the Ordnance Department, the immediate officer in charge of construction of both the Laclede company's munitions plants, has arrived with his staff of assistants.

Though the details of the plant are not available for publication, it is understood that this plant will be comprised of ten big buildings of steel construction, the largest of which will be a machine shop more than a quarter of a mile long. The first of the munitions plants started at St. Louis for the Government by the gas company was described in a recent issue of the AMERICAN GAS ENGINEERING JOURNAL.

New Gas Producers at Wheeling Plant Nearing Completion

The work on the new gas producers at the Bellaire Bottle Works, Wheeling, W. Va., is rapidly nearing completion and the plant will be in operation in a short time. The large stack has arrived and will be erected shortly. A fence is being erected about the property of the bottle company and the Progressive coal mine.

Pipe Line to Supply Houma With Gas Will Be Completed on Scheduled Time

When work was started on the building of a gas pipe line from the Terrebonne gas field, 20 miles below Houma, to Houma, La., about a month ago, it was realized that a record for speed would have to be made to complete the line by Oct. 15, the date named in the contracts. At the present time all indications point to the successful completion of the task, which will put natural gas under the boilers of a half dozen of the biggest sugar mills in Terrebonne Parish, and in addition will bring it into use in all of the municipal plants and many of the manufacturing plants and residences of the city as well.

Since starting the job about 13 miles of pipe have been laid, welded and covered, loose pipe has been laid several miles more, and at the present time the mains are practically completed to within 6 miles of Houma. Working at top speed the three welding crews weld joints at the rate of three every seven minutes. The last shipment of pipe necessary to complete the main is expected within a day or so and the work will be put through to completion without delay.

Houma expects to have gas installed in the municipal plants late in October, while the various sugar plants are now assured that they can fire their boilers with natural gas by Oct. 15, when grinding will begin.

Terrebonne's sugar crop gives promise of being the banner one in the history of the parish, and the use of the gas as fuel will bring about a saving of many thousands of tons of coal this winter.

Massachusetts Gas Earnings

Combined net earnings available for dividends of subsidiary companies of the Massachusetts Gas Companies for August were $501,153, an increase of $56,418 or 12.68 per cent compared with the corresponding month a year ago.

August earnings follow:

Gas Department:	1918	1917	1916	1915
Boston	$71,623	$69,190	$67,908	$73,847
Quincy	9,795	7,131	4,212	6,705
East Boston	7,290	3,060	4,131	5,673
Newton	3,247	1,632	2,820	2,675
Total	$91,956	$81,015	$79,073	$88,902
Coal Department:				
New England Gas & Coke	....	....	53,712	32,488
New England Coal	52,688	18,266	63,953	56,090
Federal Coal	....	....	6,542	8,748
Boston Tow Boat	....	....	3,376	2,318
New England Fuel & Trans	356,509	345,453	....	....
Total	$409,197	$363,720	$127,585	$99,643
Grand total	$501,153	$444,735	$206,658	$188,548

Increases in gas outputs compare as follows (in per cent):

	August			Two Months		
	1918	1917	1916	1918	1917	1916
Boston	3.58	9.44	5.56	6.75	10.66	3.30
East Boston	8.06	10.65	16.19	12.50	11.67	10.91
Quincy	19.33	18.49	1790	27.73	18.73	14.80
Newton	10.20	12.32	14.66	15.19	13.53	14.01

Net earnings of subsidiary companies for eight months ended Aug. 31 compare:

	1918	1917	Increase	Decrease
Boston Consolidated	$709,581	$827,288	....	$117,707
East Boston	31,150	30,695	$455	....
Quincy	47,730	21,907	25,823	....
Newton	36,714	44,445	....	7,731
Total	$825,178	$924,336	....	$99,158
New England Fuel	2,444,801	1,528,200	$916,601	....
New England Coal & Coke	389,240	217,434	177,806	....
Total	$2,834,042	$1,745,634	$1,088,408	....
Grand total	$3,659,220	$2,669,971	$989,249	....

THE BASTROP GAS COMPANY, Union City, Ind., capital stock $60,000, to sink and operate oil and gas wells, has been incorporated with the following directors: G. Walter Hiatt, Don P. Shockney, Charles W. Eastman, Nelle Wall, Theodore Shockned and Bert E. Woodbury.

THE UNION NATURAL GAS CORPORATION declared the quarterly dividend of 2½ per cent, payable Oct. 15 to stockholders of record Sept. 30.

THE DEFIANCE GAS & ELECTRIC COMPANY for the twelve months ended June 30, 1918, reports gross earnings of $260,133, net after taxes $82,561 and surplus after charges $38,661.

THE TACOMA GAS & FUEL COMPANY, Dover Del., $5,000,000. C. L. Rimlinger, M. M. Clancy and F. A. Armstrong, of Wilmington.

THE AMERICAN GAS & ELECTRIC COMPANY quarterly dividend of 2½ per cent on common, payable Oct. 1, and 1½ per cent on preferred Nov. 1.